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CONSTRUCTION

LAGS, CRITICISM NOTED IN CONSTRUCTION INDUSTRY

Unfinished Projects, Unreceived Resources

Tashkent PRAVDA VOSTOKA in Russian 23 Apr 80 p 2

[Article by Ye. Rodygin, chief of the Economic Planning Section of Tashoblstroybank SSSR [Tashkentskaya Oblast Branch of USSR Stroybank]: "Build Facilities Within the Standard Periods"]

> [Text] The number of unfinished jobs is growing. Labor, material and financial resources must be concentrated on construction projects that are slated for startup.

The CPSU Central Committee and USSR Council of Ministers decree, "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality," calls for, as one of the urgent measures aimed at raising capital-investment effectiveness, a reduction in the next few years of the amount of construction not completed prior to the established standard deadlines. It is recommended that planning organs take the necessary steps toward further improving the structure of capital investment in order to use resources primarily for rebuilding existing enterprises and reequipping them with machinery.

This radical trend in planning and assimilation of capital investment found reflection at building jobs in Tashkent and its oblast. Last year, with a 50-percent increase in capital investment for production-type construction over the same period of the Ninth Five-Year Plan, expenditures for the reconstruction of enterprises and the reequipment thereof with machinery almost doubled. During the Tenth Five-Year Plan capital-investment planning improved somewhat, it was concentrated at jobs that had been carried over from the previous year and at those with facilities that were due for startup, and the number of new construction projects was reduced--situations that were aided by the work of Stroybank institutions. Thus, during the first 4 years of the Tenth Five-Year Plan the bank's institutions introduced, and ministries and agencies adopted, recommendations for an increase of almost 82 million rubles' worth of work for the introduction of fixed capital into operation at 68 construction projects.

Improvement in the capital-investment structure and in the planning and actual assimilation of funds in capital construction helped to introduce fixed capital into operation more rapidly. For Tashkentskaya Oblast construction projects alone, during the first 4 years of this five-year plan 41.6 percent more fixed capital was introduced into operation than during the same period of the preceding five-year plan. However, not all of this led to a reduction or even to a stabilization of the amount of uncompleted construction, since it occurred at a time when the actual amount of capital investment had increased by 59.4 percent.

Serious shortcomings are preventing a reduction in the amount of uncompleted construction and a rise in capital-investment effectiveness. The main thing is the systematic underfulfillment of tasks for introducing capacity and facilities into operation, which leads to a stretchout in periods for erecting facilities, an increase in the amount of uncompleted construction, a freezing of large amounts of funds, and an increase in construction costs.

At the start of the five-year plan there were 1,126 construction jobs in Tashkent and its oblast that had not been completed, including 561 for production purposes. At the start of 1979 the figures were, respectively, 1,348 and 735. On 1 January 1980 uncompleted construction for the Tashkent region had risen by 88.3 percent, or 671.3 million rubles, over the start of the five-year plan. And the total amount of uncompleted construction at the start of 1980 was 1.435 billion rubles, or 750 million rubles above the norm.

Thus, in order to reduce it to the standard level, 750 million rubles' worth of fixed capital above the goal must be introduced into operation this year. The task is complicated, but it must be carried out. In order to do so, both clients and contracting organizations should concentrate all labor, material and financial resources on jobs that were carried over from last year, primarily on jobs that are due for startup.

Meanwhile, the prevailing situation in capital construction in the city and the oblast testifies to a continuation of the dispersion of resources. Thus, the fulfillment of tasks on projects due for startup last year was about 52 percent. The construction projects of most ministries and agencies did not cope with tasks for introducing fixed capital into operation. For example, uncompleted construction rose by 5.3 million rubles' worth for railroad construction projects, 1.1 million rubles' worth for the Krasnaya Zarya production administration for clothing, 2 million rubles' worth for a textile combine, 5.1 million rubles' worth for Tashoblvodokanal [Tashkent Oblast Administration for Water and Sewer Lines], 1 million rubles' worth for Uzbeksel'mash [Uzbek SSR Agricultural Machinebuilding Plant], 5.6 million rubles' worth for a tractor plant, 8.1 million rubles' worth for the Almalyk Mining and Metallurgical Combine, 1.2 million rubles' worth for the Santekhlit plant, 126.6 million rubles' worth for the Chirchik production administration Elektrokhimprom, 1.9 million rubles' worth for Chirchiksel'mash [Chirchik Agricultural Machinebuilding Plant], and so on.

As a result of the regular underfulfillment of construction plans, in Tashkent alone more than 40 construction projects whose erection time had long exceeded all the standard periods were counted in 1979. Of these jobs, 20 again proved to be incomplete last year, and the amount of uncompleted work on them was worth 50 million rubles. The stretchout in construction caused an increase in the original budget-estimated cost for a large number of facilities, including the Sredazgazavtomatika plant by 878,000 rubles, the Vtortsvetmet plant by 2.9 million rubles, Gosbank office buildings by 761,000 rubles, and so on.

The managers of the "old-timer" construction projects, together with the managers of the construction organizations, must not only organize fulfillment of the 1980 goals but also provide for above-plan introduction of fixed capital in order to reduce the amount of uncompleted construction as much as possible.

The situation of incorrect planning intensifies when the dispersion of funds over numerous jobs piles up, budget-estimated costs are understated, standard construction-time periods are overstated and not enough funds for carryover and startup jobs are allocated--all of this wittingly. Such violations in capital-investment planning in 1979 were committed by many ministries, agencies and local soviets of people's deputies.

These errors must not be repeated during capital-investment planning, since incorrect planning compels contracting organizations to disperse labor and material resources over numerous jobs.

Cases of late and incomplete issuance of design and budget-estimating documentation for facilities under construction and inadequate delivery to Stroyindustriya enterprises of reinforced-concrete and metal structure, parts and basic building materials, which slow the construction pace considerably, are also encountered. Glavtashkentstroy [Main Administration for Construction in Tashkentskaya Oblast] and the republic's construction ministries and other ministries that are doing construction work in Tashkent and Tashkentskaya Oblast are slow in introducing the brigade contract into construction subunits, when this form of production organization provides for timely and, often, prescheduled turnover of facilities for operation.

In certain cases the clients are slow in expropriating land for construction, in demolishing structures, and in preparing existing departments for forthcoming rebuilding.

All these deficiencies in organizing construction operations, design and planning lead to growth in uncompleted construction volume. This is why a reduction in the next few years of the amount of construction not completed prior to the established standard deadlines is a most important task for builders, designers, planning-organ workers and all participants of the construction complex.

Quality Control

Moscow MOSKOVSKAYA PRAVDA in Russian 3 Jun 80 p 2

[Article by K. Magnushevskiy: "A System for Evaluation, and an Evaluation of the System"]

> [Text] We return to the correspondent's news item, "There Is No Equal Responsibility," which was printed 20 March 1979. This concerned some of the important problems of industrialized housing construction that have been raised in practice--about monitoring construction operations and about the system for evaluating finished apartment houses.

The newspaper article emphasized the thought that the time had come when it was urgently necessary to create a scientific foundation for a system and methodology for controlling construction quality, which the existing system of monitoring and evaluation, in essence--there is no system. The chairman of the acceptance commission and its members, in drawing conclusions about the quality of an apartment house start, as a rule, just with documents that supposedly evaluated objectively, during intermediate monitoring, the good quality of the operations carried out.

The word "supposedly" is not accidental. The compilation of these documents has no system and more often than not it is governed by a subjective attitude toward the matter by the people who have the right to make the evaluations. This has supplied a basis for subjecting various paragraphs of the instruction of SN-378-77 [Construction Norms 378-77], which is the directive about the acceptance of finished buildings, to criticism.

The editorial office has received a reply to the article, which is signed by Deputy USSR Gosstroy Chairman N. N. Kachalov. The first part of it recognizes the correctness of the critical remarks about there being "a number of important deficiencies in organizing monitoring of the quality of construction of apartment houses in Moscow on the part of contracting and design organizations, clients, local organs that monitor architecture and construction, and the banks that do the financing." The "inadequate exactingness of the acceptance commissions" is recognized.

But the reply disputed that part of the article that criticized various paragraphs of the instruction: "As for the remarks of the author of the article, 'There Is No Equal Responsibility,' apropos the 'disadvantageousness' of SN-378-77, with citations of statements of workers of Gosarkhstroykontrol' [State Monitoring of Architecture and Construction] of RSFSR Gosstroy, this was based on premeditated misrepresentation of the instruction which that organ committed when it copied and distributed the instruction to local organs of arkhstroykontrol' [monitoring of architecture and construction]." And further, "said distortion of the instruction was the cause of the publication of an article by RSFSR Gosarkhstroykontrol' workers, 'According to the Report, and in Fact,' and the editoral comment, 'The Formal Act,' that was false in this respect, in the newspaper SOVETSKAYA ROSSIYA.

And so, according to the categorical assertion of Deputy USSR Gosstroy chief N. N. Kachalov, two newspapers have published articles that led not only the readers astray but also people who have a direct relationship with construction.

It was necessary to deal again with all the organizations where the facts for the newspaper article had been dug out and also to converse with many other workers who know well the whole cycle of industrialized housing construction. The result: nothing new. All the specialists declared: the instruction for the most part was not suitable for practical work.

Let us return to that part of the reply that speaks about "premeditated misrepresentation' by RSFSR Gosstroy of the instruction when it was copied and about the fact that, they say, this caused the appearance of the article in MOSKOVSKAYA PRAVDA. Is this the case?

It is known that RSFSR Gosstroy did not agree with some of the paragraphs of the instructions, particularly with the fact that the system for evaluating quality is identical for apartment houses and industrial facilities. This organization drew up a recommendation that took stock of the instruction's defects and sent a draft of them (we emphasize--a draft) out to local arkhstroykontrol' organs for discussion. Then these considerations were subjected to wide discussion by workers in the field. RSFSR Gosstroy intended to send it to USSR Gosstroy for review and approval. And the author of the reply sees this as criminal?

As for USSR Gosstroy, for some reason or other it did not send its draft of this instruction to local arkhstroykontrol' organs and, as is apparent, approved it without having considered the opinions of the people who do the work.

And still another comment. The reply, as has already been stated, asserts that the articles in both papers supposedly were based on cases that resulted from "distortion" of the instruction by RSFSR Gosstroy. Let us note that the draft of the amendment to the instruction has no bearing on either the examples illustrated in the material or to the general trend of the article.

That's the whole thing, the real state of affairs in the conflict of the two related agencies, a conflict that the reply tries to convert into a fault of those whose aim is to create a document not for the files but for rational use in construction. Let us note that crude pressure was exerted on the specialists who made the material available for the press workers.

Now about the instruction itself. There are objections in the reading of the paragraphs that contain concrete instructions, as there are in the basis on which to make an evaluation of the finished building.

Let us begin with the formula in accordance with which overall evaluations of construction and installing work quality are made, based upon an evaluation of the quality of execution of the various operations. It is not clear here what methodology will be used to make these intermediate evaluations, and the main thing, what measuring tool or instruments will be used in so doing, and how will they be used, and also what allowances will be made.

The opinion of the specialists has been cited above: there is no scientific basis for this, and evaluations of this sort more often than not are arrived at arbitrarily. And since there is no methodology for an objective intermediate monitoring or new and more reliable measuring resources for an evaluation, then the formula, although it poses as being scientific, is scarcely suitable for use in practice in the work of acceptance commissions.

This is not the only shortcoming of the formula. The most important one is that the intermediate evaluations in points are left almost as a whole to the contractors and clients. Others may not, but workers connected with construction work know what a threat this "methodology" conceals: both these participants in construction are interested primarily in accelerating introduction of the facility into operation. The instruction is vague about responsibility for quality. In using this loophole some contractors and clients who are not especially principled can make use of the instruction that has been presented as authority not only for raising the evaluation of the intermediate operations but also as a basis for turning over housing with defects with an evaluation of, let's say, "good."

And there are many such cases in construction practice. Here is the freshest example of the harmfulness of intermediate monitoring. Geodesists of the 264th Administration "did not comment" (apparently because of the lack of a strict method) that 78 panels had been installed incorrectly during construction of the 40th building in Strogino. Now, in order to bring the building to the required strength, about 2,000 holes have been drilled into the parts. Cases similar but not so scandalous also are found in other areas of large-scale development.

Opinions about deficiencies of the instruction have been recorded in documents. In a letter sent to USSR Gosstroy by RSFSR Gosstroy, for example, it was pointed out that the instruction's criteria for evaluation of the quality of structural members and types of work are given in extremely oversimplified fashion, without a concrete methodology.

And so additional study of the question persuades that the denial by the deputy USSR Gosstroy chairman is not very well justified. The author of the reply confirms this indirectly in speaking about the fact that "USSR Gosstroy, jointly with a number of other authoritative agencies, is preparing a draft of new rules for the acceptance for operation of facilities whose construction has been completed. These rules will call for higher requirements for quality of the buildings erected and prohibit acceptance of such buildings with defects."

Attempts to save face at any price usually do not serve the cause. Would it not be better to develop an effective methodology for controlling construction quality and to get these same "obstinate" practical workers involved? With their assistance, USSR Gosstroy's scientific-research institutes undoubtedly will create a full-fledged, useful procedural document that will effectively promote a rise in the quality of buildings under construction.

Solution of a question that is a topic of constant concern to the party and the government--to build for the Soviet people apartment houses that are increasingly convenient and comfortable--will thereby be accelerated.

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CONSTRUCTION

GRAIN ELEVATOR CONSTRUCTION, RELATED TECHNIQUES DISCUSSED

Industry Overview

Moscow BETON I ZHELEZOBETON in Russian No 5,1980 pp 2-3

[Article: "The Status and Prospects of Erecting Structures of the Grain Elevator Industry"]

[Text] Silo structures and operations buildings, which require the greatest consumption of materials, and are the most complex structures, constitute the principal portion of construction for enterprises that store and process grain. The primary materials for the load-bearing structural forms of these buildings are prefabricated and monolithic reinforced concrete and steel, of which prefabricated reinforced concrete has had the broadest application. Prefabricated reinforced concrete comprises about 80 percent of the total consumption of reinforced concrete for erecting grain elevators with a capacity of 1.2 million cubic meters per year. Monolithic reinforced concrete is principally used for the footings of structures and operations buildings (15 percent) and for walls of silos that are erected in sliding forms (5 percent). Steel structural forms are used chiefly in the framework portions of the structures above the silos and in the walls and slabs of independently standing cylindrical silos that have diameters of 15 and 18 meters.

During the past 10 years silo structures and operations buildings have primarily been erected with 3 x 3 meter grids of prefabricated reinforced concrete modular units with the usual reinforcing. More than 95 percent of all of the grain capacity is being constructed by using such structural forms. However, experience has shown that along with significant achievements in grain elevator construction--the increasing volumes of capacities that are being introduced, high labor productivity during erection and a reduction in construction time and material consumption--there are still a number of defects in this sector of construction. This relates, first of all, to the capacity structure. The universal use of silos of the same type from 3 x 3 meter block sections limits the possibilities of improving construction efficiency. Increasing the capacity of individual silos and establishing the optimum correlation of the various capacities that satisfy construction and operational requirements has important significance in this regard.

The reduced operational reliability of certain principal components in the structures is also a defect. For example, the low durability of the silos' monolithic walls is characterized by an early, intolerable appearance of cracks which leads to the necessity of capital reinforcement for the walls after a limited period of operation. This is the result of incompletely calculating the effective loads and actual operations of the structures, violating the technology of construction and deviating from designs.

Instances are noted of atmospheric condensation passing through the joints of the wall components in prefabricated silos when waterproofing measures have not been taken, which testifies to the insufficient validity of certain design approaches.

The use of prestressed structural forms to an insignificant degree, especially for the walls of silos (less than 5 percent of the total volume), remains an essential defect in current grain elevator construction. If a practically acceptable method of prestressed reinforcement for massive construction under building conditions cannot be found at the present time for monolithic concrete silos, then such methods have been worked out for prefabricated concrete silos and the matter consists only of expanding their production volume under plant conditions. An increase in the output of prestressed components does not present new problems for builders since prestressed components are interchangeable with common components.

Despite the high level of prefabrication in grain elevator structures, the use of monolithic reinforced concrete in foundations, which comprises about 15 percent, is a definite defect of them. The scattered nature of construction sites and their distance from industrial bases often makes it impossible to centrally obtain monolithic concrete and its relatively small volume makes the installation of modern on-site concrete units inadvisable. Local preparation of monolithic concrete that is of intolerably low quality for foundations is a consequence of this.

The labor consumption for erecting monolithic grain elevators is quite high and it exceeds the labor consumption for erecting prefabricated grain elevators by 2 to 3 times, which is one of the main reasons for the insignificant growth in monolithic grain elevator construction. It is necessary to sharply increase the level of mechanization in reinforcement and concrete work to provide rival capabilities and quality when constructing monolithic reinforced concrete grain elevators.

Further improvement in modular planning and structural form approaches are being directed toward optimizing the parameters and ratio of the types of silos in use, and toward improving the efficiency, operational reliability, industrialized nature and interchangeability of the structural forms. The realization of these growth trends has been prepared, to a significant degree, by a series of research, design and experimental work that has been done in recent years.

The TsNII [Central Scientific Research Institute] of Design for the Grain Industry has published instructions for designing grain elevators (BN-261-77), which are located principally in the section on grain silos, "Directions for Designing Silos," which was worked out by the TsNII of Design for the Grain Industry and by the NIIZhB [Scientific Research Institute of Reinforced Concrete] and prepared for publication by the Leningrad Industrial Construction Design Administration. A new design method for grain silos, which more completely takes into account their actual operations and the nature of effective loads and influences, is presented in the Directions, and new requirements for structural form approaches have been formulated which make it possible to significantly increase the operational reliability of silos. In particular, calculations for cylindrical silos were introduced which take into account bending moments and temperature influences, the dual reinforcement of all of their walls which are not prestressed has been recommended, the calculations for a wall's resistance to cracking has been more precisely defined by taking into account the fluctuation and alternating nature of loads, and other design and structural approaches were also introduced.

The TsNII of Design for the Grain Industry in conjunction with the VNIIZ [expansion unknown] is completing work on the ideal capacity for silos which will make it possible to establish an expedient relationship between the various capacities that form an enterprise. Obviously, other types of silos that have undergone experimental testing and have reached high levels of technology and economy will also be used along with silos from 3 x 3 meter modular units. Numbered among them are precast frames with cylindrical silos 6 meters in diameter and independently standing silos 18 meters in diameter.

Construction of steel grain silos primarily in the form of individual structures 18 meters in diameter with a capacity of up to 3 tons of grain will show significant growth during the 11th Five-Year Plan. However, the principal material for grain capacities remains reinforced concrete, the volume of which will be maintained at approximately the present level. The greatest growth in capacity will, as before, be obtained from prefabricated grain elevators, due to their considerable advantages in labor and material consumption in comparison with monolithic grain elevators. The leading scientific research and design organizations have given much attention in recent years toward improving structural form approaches to prefabricated grain elevators and toward improving their efficiency.

Components for silos from 3 x 3 meter modular units and also curved linear prestressed components for silos 6 and 18 meters in diameter that have been developed by the TsNII of Design for the Grain Industry and by NIIZhB stand out as a principally new approach. Varying in their geometric parameters, these components have a standard structural form approach and a single plant production technology.

Experimental production of the described components at plants in the Main Administration for Special Elevator Construction in the RSFSR Ministry of Rural Construction for building grain elevators in the city of Mineralnye Vody and at the Moscow milling combine No 4 and other sites has confirmed their high technological nature and has made it possible to decrease labor and steel consumption by 20 to 30 percent in comparison with analogous typical components.

The use of so-called structural form protection from moisture penetration for joints, which has been achieved by the TsNII of Design for the Grain Industry in conjunction with the Grain Elevator Construction Organization is, in essence, another important approach in developing prefabricated components for silos. The structural form protection was resolved identically for all types of components. Tests at several sites, which were performed by the TsNII of Design for the Grain Industry in conjunction with TsNIIEP [expansion unknown] of Rural Construction under laboratory and actual conditions, have shown that structural form protection of joints reliably provides for their waterproofing and its use in the exterior walls of prefabricated silos is advisable.

The construction of a silo structure with structural form protection of joints at Vyselki station in Krasnodarsk Kray.

The introduction of prefabricated foundations for the silo structures of grain elevators in Ayaguz, Kamysh Zarya and at other sites, based on designs by the TsNII of Design for the Grain Industry and the State NII of Design for the Central Asia Grain Industry, is increasing the level of prefabrication for primary grain elevator structures. The technical and economic expediency of using prefabricated foundations was demonstrated at these experimental sites which made it possible to reduce the consumption of reinforced concrete and labor for construction and to increase the volume of prefabricated reinforced concrete used practically to 100 percent. After the experiments are concluded, recommendations will be worked out for using prefabricated foundations for grain elevators under various soil conditions.

In order to reduce labor consumption and to accelerate installation the prefabricated components for silo structures are being consolidated. The TsNII of Design for the Grain Industry has developed structural forms for subsilo reinforced concrete hoppers that are combined with cornice components for structures type SKS-3 and large dimension slabs for the roofs over the silos (3 x 6 meters) of structures type SKS-6 and SKM-6. The introduction of these structural forms in 1978-1979 has already made it possible to reduce the number of fitting pieces in slabs under and over silo structures by 30 and 50 percent, respectively.

The TsNII of Design for the Grain Industry and NIIZhB have developed a structural form with curved linear prestressed components for cylindrical silos 6 meters in diameter that constitute a third of the ring. While preserving the structural features of the curved linear components that have four cuts by means of consolidating components, a reduction was achieved in the number of fitting pieces and vertical joints by 33 percent, and in the consumption of steel by 15 percent. Components in such a structural form are being used for building completely prefabricated grain elevators at Dolinskaya station in Kirovogradskaya Oblast. For the first time in grain elevator construction practice the operations building is being made up of silo structure components with cylindrical silos. Such a standardization of structural forms and interlocking buildings has made it possible to reduce the number of size types to 20 kinds. The efficiency of completely prefabricated grain elevators with cylindrical silos 6 meters in diameter is improving significantly.

Along with the practical development of new modular planning approaches, the experimental introduction of prefabricated silo structures from modular units that are efficiently planned has made it possible to reduce the consumption of materials and cost in comparison with the usual structures by 10 to 12 percent. On the basis of the results of the experimental construction the Khar'kov Grain Industry Design Administration has developed typical designs for structures with efficient planning, the application of which will yield economic results when expediently combined with the usual structures.

Speaking of prefabricated structural forms for silos, typical design 3.702-2 with prestressed fluted silos 12 meters in diameter should be noted. Their walls have joints with structural form protection and are formed from cylindrical formwork panels; then, after being joined together they are assembled in rings with a mass of up to 25 tons. Such an approach to silos is economical in comparison with silos 3 x 3 meters--the consumption of concrete was reduced to 40 percent and steel by 10 to 15 percent. Two fluted type grain elevators with a total capacity of more than 150,000 tons were built in the Moldavian SSR.

The core of a formwork casing for silo components with a diameter of 6 meters before the reinforcing has been wound on.

Improvements in the structural forms for monolithic silo structures is continuing. The Rostov and Khar'kov Grain Industry Design Administrations are working out typical designs for monolithic structures with silos 9 and 6 meters in diameter, respectively. The new recommendations for designing silos that were adopted into the Directions and which provide a significant improvement in the operational reliability of monolithic grain elevators have been taken into consideration here.

The TsNII of Design for the Grain Industry has worked out a combined sliding adjustable form for erecting monolithic walls of grain elevators. The structural form successfully combines the merits of both formwork casings. Practical testing has shown that the use of the formwork casing makes it possible to reduce labor consumption and to improve the quality of erecting monolithic walls with some reduction in the pace of construction.

Together with improving and developing structural forms and methods for erecting grain elevator structures, it is necessary to intensively adopt the structural form approaches which have been developed. It is necessary to complete series 3.702-1 of standardized components for grain elevator construction while taking into consideration all the recent favorable results of experimental construction.

The broad introduction of prestressed standardized components for silos requires the annual delivery to the grain elevator construction sector of no less than 10 ANM-3.5 reinforcement winding machines and 25,000 tons of seven-strand reinforcement cable with a diameter of 6 mm.

Interlocking structures, increasing the height of the silo's capacity, consolidating precast components, including by means of using porous clay filler concrete, developing designs for prefabricated silos with a diameter of 18 meters and increasing the level of complete prefabrication in grain elevator construction are further trends in the work to improve modular unit planning and structural form approaches for grain elevators.

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Unit, Enterprise Standardization

Moscow BETON I ZHELEZOBETON in Russian No 5,1980 pp 4-6

[Article by A. N. Prostoserdov, engineer (TsNII of Design for the Grain Industry); P. V. Chichkov, candidate of engineering sciences (TsNIIEP of Rural Construction): "Standardization of Structural Forms for Grain Elevators and Enterprises that Process Grain"]

[Text] Enterprises that store and process grain combine a large number of buildings and structures for primary and auxiliary purposes--silo structures and operations buildings of grain elevators; devices for receiving and issuing grain, raw materials and finished products; silo and ground-type warehouses; production buildings of processing enterprises (mills, shelling and mixed feed shops), administration and other buildings. The individual buildings and structures that are part of various complexes have standardized modular planning and structural-form approaches and, as a rule, are built according to typical designs. In all, more than 360 typical, repeatedly used individual designs with various structural form approaches that have 1600 types of reinforced concrete products have been used for building these structures up to recent times.

An analysis of working designs that have been completed by the TsNII of Design for the Grain Industry and the TsNIIEP of Rural Construction in collaboration with the Elevatororgstroy and Ukrorgtekhsel'stroy trusts has made it possible to reduce the number of designs that are used by one third and to work out a schedule of designs that are recommended for enterprises that store and process grain. This schedule was coordinated with USSR Gosstroy and has been adopted into practice since 1979; its adoption makes it possible to reduce the products list of reinforced concrete structural forms to 660 types and to increase the level of prefabrication in the construction of grain elevators and grain processing enterprises by 10 to 12 percent.

On the basis of the shortened schedule of designs a catalogue has been developed, which has been approved by RSFSR Gosstroy, of standardized prefabricated reinforced concrete articles and structural forms for grain elevators, mixed feed plants and other grain processing enterprises. The catalogue contains 588 items and types of products (based on series 3.702-1, II-20 and others). Similar catalogues are being worked out for construction in the Ukraine and Kazakhstan. The products list of reinforced concrete articles is even shorter in republic catalogues; for example, the catalogue for the UkSSR contains 280 items and types of reinforced concrete products in all. Work is being done to reduce the number of secondary and auxiliary buildings by means of combining them.

Requirements for the principal parameters of silo structures are presented in SNiP [Construction Standards and Specifications] II-91-77 "Industrial Enterprise Structures" and SN 261-77 "Instructions for Designing Grain Elevators, Grain Warehouses and Other Enterprises, Buildings and Structures for Processing and Storing Grain." According to this, the grid of dividing axes for the silos in the structures equals 3 x 3, 6 x 6, 9 x 9 and 12 x 12 meters, the exterior diameters of round silos comprise 6, 9, 12, and 18 meters, and the heights of the walls of the silo and the floors above and below the silo are in multiples of 0.6 meters. These parameters are assumed when developing the working series 3.702-1 of typical standardized prefabricated reinforced concrete structural forms for silo structures and operations buildings of grain elevators and enterprises that process grain (Illustration 1).

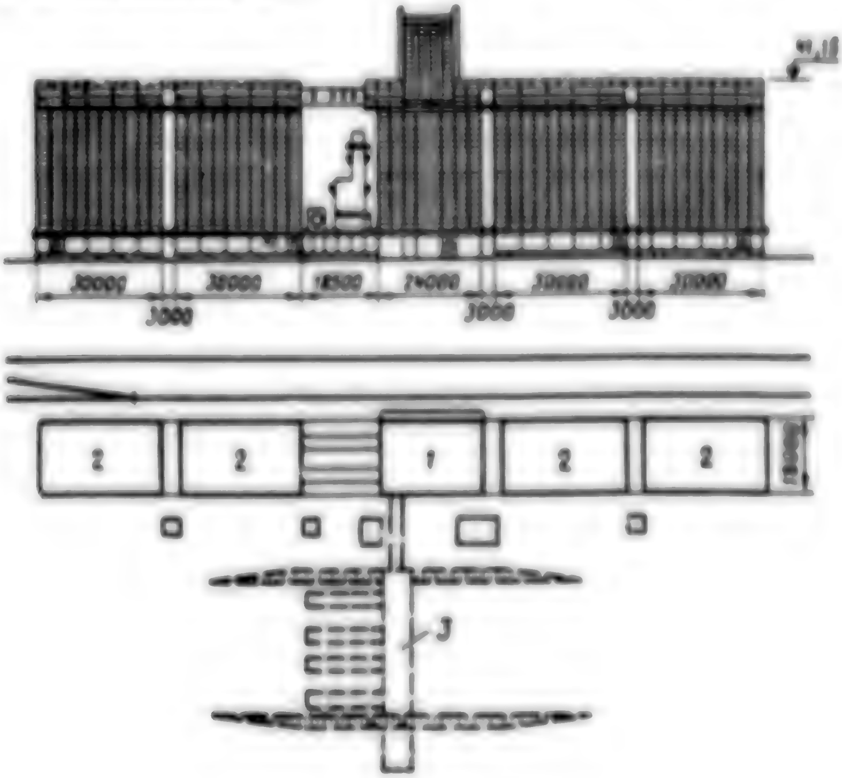


Illustration 1. Grain elevator with prefabricated structural form type LS-4 x 175-71

1--operations building; 2--prefabricated silo structures type SKS-3-60; 3--receiving device

Typical designs for structures and operations buildings of grain elevators that have silos with dimensions of 3 x 3 meters, primarily according to which construction will be carried on during the current five-year plan, are being worked out by using structural forms of the above series (Illustration 2).

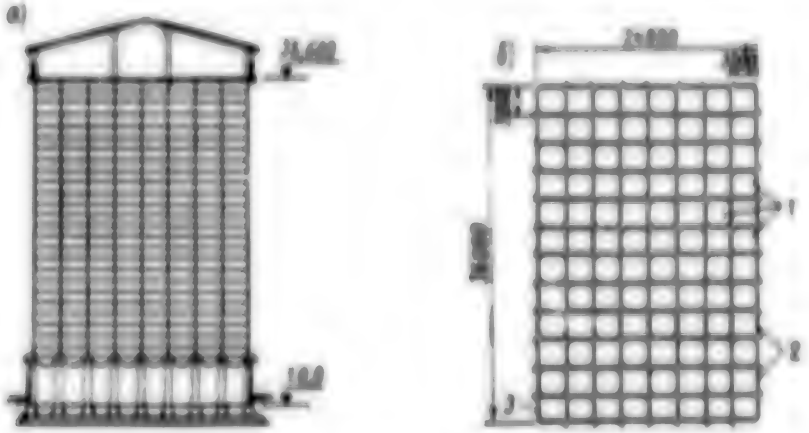


Illustration 2. Prefabricated silo structure type SKS-3-96
a--cross section; b--plan view;
1--modular units; 2--flat panels; 3--corner components

The standardized silo structures type SKS-3 have identical modular planning and structural form approaches with varying capacities (11,200, 18,000 and 27,000 tons): subsilo floors with a height of 6 meters and a column grid of 3 x 3 meters, silo walls 30 meters high and a frame floor over the silo. The footings are monolithic reinforced concrete and the rest of the structural forms are prefabricated. The silo walls are assembled from modular units with dimensions of 3 x 3 x 1.2 meters arranged in checkerboard fashion; the corner and flat components are located along the perimeter of the structure in the spaces between the modular units. The wall components are joined with each other in cement paste by bolt couplings with vertical joints bound together. Such a structural form ensures the total spatial stability of the structures and that the adjacent wall components in elevation work together.

In recent times silo structures with so-called efficient planning have been used in practice. Consolidated silos are formed in these structures from cells with a dimension of 3 x 3 meters by means of eliminating sections of wall components; the economy in prefabricated reinforced concrete reaches 5 percent. There are designs for SKS-3 type structures with increased height in the silo section up to 39.6 meters instead of 30 meters, and also with a reduced subsilo section; with this a reduction in the consumption of prefabricated reinforced concrete is also achieved for a single capacity and the compactness of the structure is increased.

The designs for operations buildings of grain elevators are being worked out on the basis of structural forms for silo structures with built-in operational quarters and superstructures over the silo that are made of steel structural forms.

In 1978 series 3.702-1 was reworked by the TsNII of Design for the Grain Industry, the TsNIIEP of Rural Construction in collaboration with NIIZhB in connection with the adoption into practice of SNiP II-21-75 and SN 261-77; products for silo walls with dimensions of 3 x 3 meters with structural form protection for the horizontal joints in the exterior walls from water permeation were included in the series. All of the products for the silo walls were standardized according to the size of the formwork casing, including the spacing of the bypass openings as well, irrespective of the type of reinforcement. Silo walls were reinforced with a consolidated curved mesh and prestressed pieces with K-7 cable or Vr-II wire (a single row for walls with a thickness of up to 100 mm), which simplifies reinforcing work and reduces the consumption of steel.

When the series was being reworked the products list for columns was expanded by means of incorporating the columns above the silos. Consolidated components were included in the series which combine the hoppers and the slabs with the cornice components, which simplifies the structural form and improves installation conditions. Prefabricated-monolithic slabs are specified for the roofs over the silos which facilitate the installation of diverse mechanical openings. Finally, grade M 300 concrete according to GOST 10180-74 is acceptable for a majority of the products instead of the same grade according to GOST 10180-67, which makes it possible to reduce cement consumption.

Use of the new series improves the quality of prefabricated reinforced concrete products for grain elevator structures, improves their operational reliability and reduces steel and cement consumption.

The standardized parameters for the structural forms of silo structures makes it possible to further improve them: experimental consolidated structural forms of modular units with dimensions of 3 x 3 x 2.4 meters and 3 x 6 x 1.2 meters and prefabricated and prefabricated-monolithic footings are being developed; the substitution of lightweight concrete for heavy concrete, structurally protected vertical joints and simplified assembly couplings are being proposed.

The experience of operating silo structures with 3 x 3 meter silos testifies to the simplicity of assembly, fine technological and economic indices for the structures, their great spatial stability, and others. However, several defects have also developed in connection with the technology of storing grain, most of all with small size silos. Therefore, structures with silos 6 and 9 meters in diameter should gradually replace structures with 3 x 3 meter silos. The standardized structural forms for subsilo floors that were established in series 3-702.1 make it possible to build silo structures with silos 6 meters in diameter from monolithic or prefabricated reinforced concrete.

On the basis of these structural forms a series of silo structures type SKM-6 with various capacities and with walls that are erected in a sliding form were developed (Illustration 3). In addition, there is a typical design for a grain elevator that has silos of the same dimensions in plan that are erected from monolithic reinforced concrete from the footings in an adjustable structural form by the TsNII of Design for the Grain Industry.

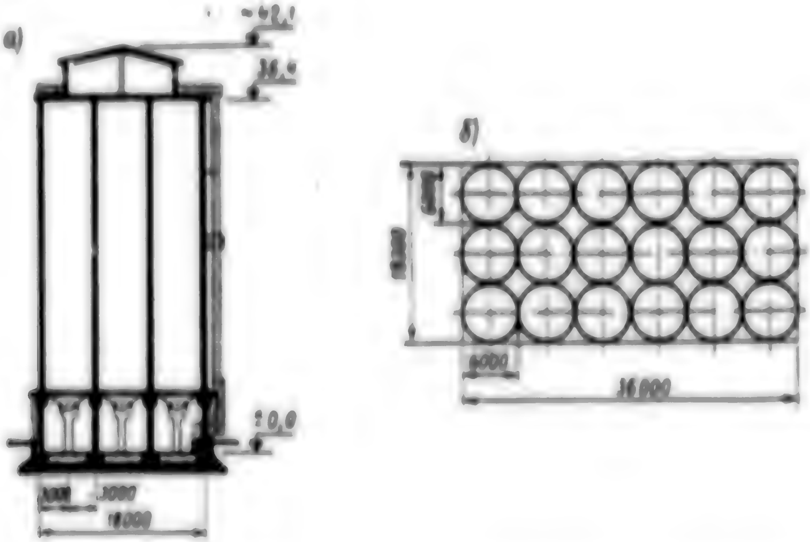


Illustration 3. Silo structure type SKM-6 of monolithic reinforced concrete a--cross section; b--plan

The use of a standardized form of this type makes it possible to eliminate many defects that are peculiar to sliding forms. The special feature of this form consists, basically, in the structural form of the corner couplings of the components by which these corner components are horizontally shifted by the movement of the primary panels of the form. The form is being tested on several structures.

An experimental test is being conducted on the structural form for the operations building of a grain elevator based on a prefabricated silo structure with silos 6 meters in diameter. The production areas in it are formed by means of special components--dual branching type columns which bear the load of the slabs in the form of collar beams and steel hoppers (the same as the subsilo bottom slabs).

There are also typical designs for silo structures with silos 9 meters in diameter from monolithic reinforced concrete, fluted type silos 12 meters in diameter from prefabricated reinforced concrete and also designs for silos 18 meters in diameter, that are undergoing experimental testing.

Warehouse structures of the silo type for processing enterprises are based on the same modular planning and structural form approaches with the exception of the subsilo portion (Illustration 4). There may be a single or several subsilo floors with a column grid of 6 x 3 meters in these structures. Structural forms in series II-20, with several alterations connected with the large loads and coupled to the silo section, are used, as a rule, for subsilo sections and also the floor above the silo. Twin typical structural forms are used in a number of designs.

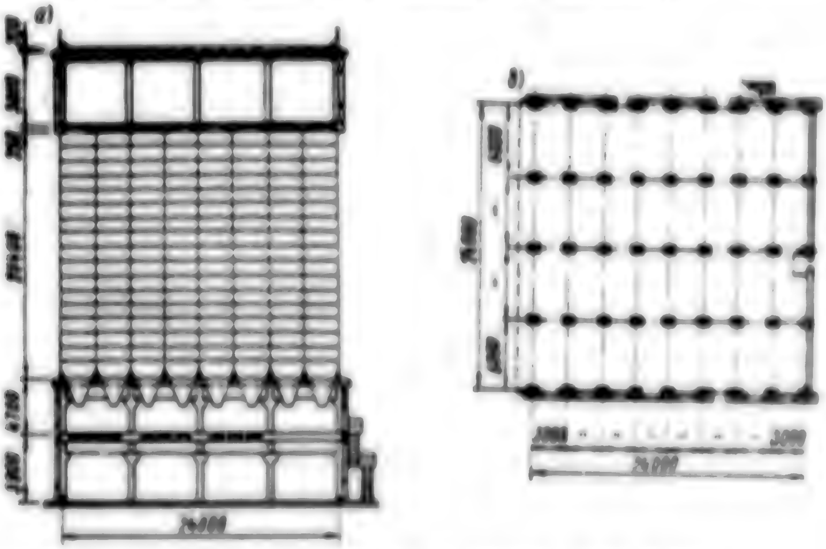
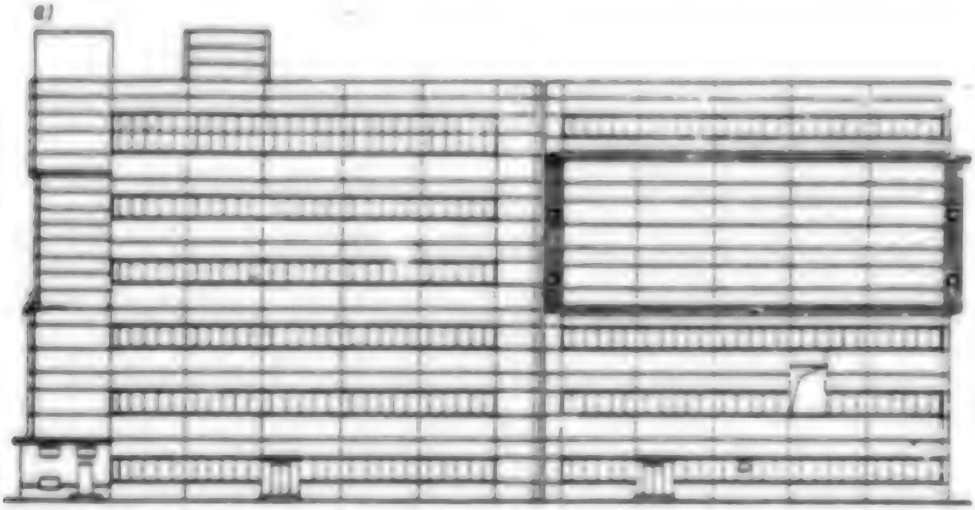


Illustration 4. Raw material building of a mixed feed shop
a--cross section; b--plan

The walls of silos for storing flour have heat insulation in the form of air tunnel passageways with steel frames (Illustration 5). The heating from the hung panels is being tested in experimental sequence.



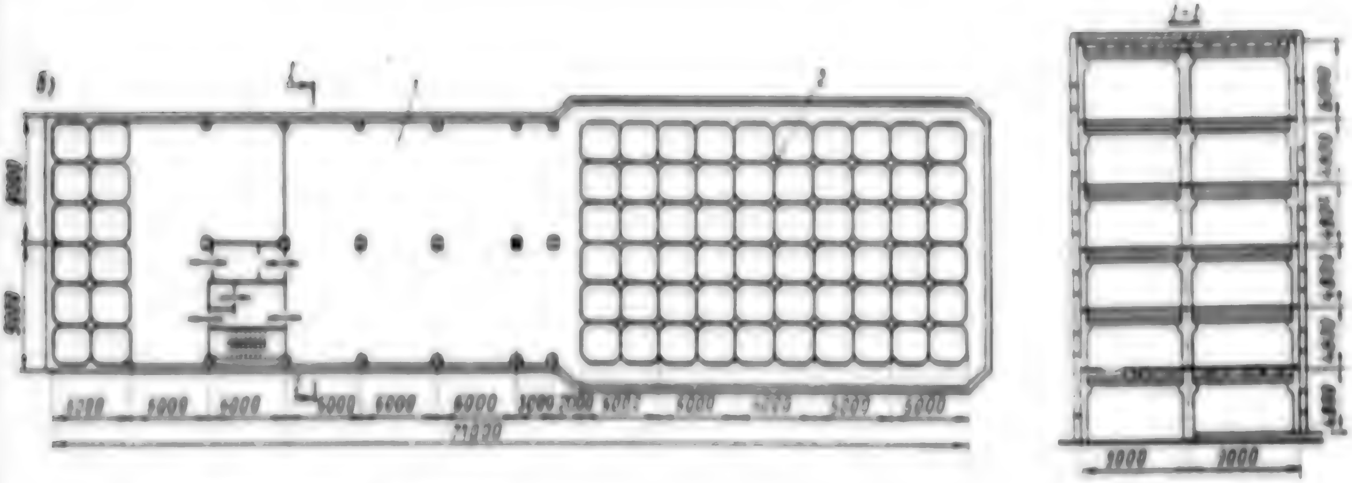


Illustration 5. A mill
a--facade; b--plan
1--production building; 2--silo warehouse for the loose storage of flour

Special plates with dimensions of 3 x 6 meters with a reduced thickness, through which mechanical openings can easily be punched, are used for the slabs in these buildings. A layer of monolithic reinforced concrete is laid over these plates and a prefabricated-monolithic structural form is formed. In the places where there are no openings the usual typical plates may be laid.

A frame of series II-20 (1.420-12) prefabricated reinforced concrete with a column grid 9 x 6 meters (mills) and 6 x 6 meters (shelling shops and mixed feed shops) is provided in production buildings. In conjunction with the fact that the buildings have a height of 7 to 8 stories, and series II-20 was developed for buildings up to five stories, the columns of the lower floors were strengthened in comparison with typical columns.

In packaged goods warehouses typical structural forms of series II-20 with 6 x 6 meter column grids are used. A monolithic reinforced concrete slab is laid over the plates of the slab in these warehouses in view of the large concentrated dynamic loads from the wheels of automated loaders.

Further industrialization of grain elevator construction, mixed feed plants, mills and other enterprises that process grain will make it possible to provide the national economy with dependable grain storehouses and efficient processing enterprises.

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CONSTRUCTION

FINAL TOUCHES FOR 1980 OLYMPICS DISCUSSED

Construction Engineer's Interview

Moscow STROITEL'NAYA GAZETA in Russian 14 May 80 p 4

[Interview with I. S. Borovik, chief engineer of the Administration for Preparation for Production and Construction of Olympic-80 Facilities of the Main Administration for Construction of Housing and Public Buildings in the City of Moscow, by S. Sobolev: "Rapidly, with High Quality and Beautifully"]

> [Text] At 1600 hours, Moscow time, on 19 July 1980, the first retransmission of the 22d Olympic Games will begin over 20 color-television and 100 radio channels. More than 300 color-television cameras and more than 70 mobile television stations will operate at Olympiad-80. About 2 billion inhabitants of the planet will be able to follow the competitions of the strongest athletes.
>
> The new Olympic television and radio complex will give foreign companies 22 television studios. At the sports structures 1,200 commentators' spots have been equipped, and in the OTRK [Olympic Television and Radio Complex] there are 70 booths, with monitors, for commentary.
>
> About 500 motion-picture photographers will help to make the official film for the Games of the 22d Olympiad. For this purpose the creative Olympiad-80 Association, with producer Yuriy Ozerov in charge, has been established at Mosfilm, the largest Soviet studio. Still shots of the grand occasion will be made by 125 cameramen.

Modern hotel complexes, public dining rooms and cultural and personal-services enterprises have been built to accommodate and serve athletes and tourists in Moscow. The capital's construction workers have done everything possible to cause the Olympiad's guests to say "thanks" to Moscow from the bottom of their hearts for a cordial and warm reception, for high sophistication of services, and for comfort and convenience.

Our correspondent, S. Sobolev, is conversing with Chief Engineer of the Administration for Preparation for Operations and for Construction of Olympic-80 Facilities of Glavmosstroy [Main Administration for the Construction of Housing and Public Buildings in the City of Moscow] I. S. Borovik.

[Question] Ivan Semenovich, can we compare this construction project in size and scope with anything preceding it in Moscow?

[Answer] I think there has never been such a unique construction job in the capital before. It is enough to cite just these figures: Glavmosstroy was charged with building 180 Olympic structures. More than 50 construction administrations took part in the work. About 17,000 workers came to work daily at the construction sites. And for comparison, let us recall one of the largest of Moscow's construction projects--the Rossiya Hotel. It seemed then that this structure would not have its equal for many long years. The enormous building for 4,000 guests staggered the imagination. And now today, in Izmaylovo alone, construction is being completed on a hotel complex to accommodate 10,000, and this does not seem to be unusual.

[Question] Tell us, Ivan Semenovich, which of the Olympic facilities interests you as a builder?

[Answer] Primarily, of course, the Olympic village on Michurinsky Prospekt, the Salyut Hotel in Troparevo, the Molodezhnaya Hotel at Dmitrovskoye Shosse, the Izmaylovo complex, the equestrian base in Bittsevskiy Park and the athletic-technology complex in Krylatskiy. All these structures are of interest for their architectural and engineering solutions, which are distinguished by a high degree of comfort and have been finished off in original fashion.

[Question] For the first time in domestic construction practice, the 22-story Salyut Hotel complex was erected without a framework. What did this experiment prove, what kind of a future does it have?

[Answer] A full-scale check of the architectural-layout and constructional solutions was made, and the technology for manufacturing and installing the parts and structure was worked out. As a result, the experiment at Troparevo confirmed the desirability and effectivness of erecting public buildings, primarily hotels, out of large panels without a framework. The use of members highly finished at the factory, ready for installation, enabled almost all types of work to be done simultaneously with erection, greatly reducing overall construction time. The experiment at Troparevo confirmed that when erecting public-type buildings out of large panels, the vast experience that has been gained in large-panel housing construction can be used. The framefree method greatly reduces costs and raises the effectiveness and quality of construction. As for what kind of a future it will have, in my view it is most optimistic.

[Question] Our readers would be interested in knowing, it goes without saying, what kind of basically new and original parts, structure and materials were used during construction of the Olympic facilities.

[Answer] We erected an absolute majority of the Olympic structures from unified items from the Unified Catalog. This yielded an enormous saving of time and funds. Of course, this does not mean that we did not use new things at the Olympic construction projects. Thus, for example, at the Izmaylovo hotels, bathroom box modules completely readied at the factory were installed, yielding 50,000 rubles of annual savings. New structure for ventilation box modules, stained glass and hanging ceilings were used widely.

[Question] And a last question. How will the experience in Olympic construction be used later?

[Answer] We received invaluable experience in managing such an enormous construction project. The technology of manufacturing unified parts and components was improved. The effectiveness of the brigade contract was confirmed once more. We have already mentioned the experiment at Troparevo--there will be a great future for it, it goes without saying. But the main thing is, we have become convinced by practice that we can, we know how to, and we should build rapidly, with good quality, and beautifully. This, of course, is the most valuable thing.

Olympic Village Director

Moscow NASH SOVREMENNIK in Russian No 3, 1980 pp 169-175

[Article by I. Kholod, general director of the Olympic Village: "Moscow Awaits the Olympians"]

[Text] Saturday, 19 July, when the Olympic flame will blaze forth and the 22d athletic games will be declared open at the renovated Central Stadium imeni Lenin, is not very far off.

Interest in sports is truly enormous in our day, and it is all the more so for the Olympic Games, the most important sports event. There is this singularity of the games, a phenomenon of them: according to our estimates, from 2 to 2½ billion people will watch the games on television alone. If the other mass media, such as the radio and press, are considered, then practically the whole planet will follow Moscow these days.

Our path to Olympiad-80, which we are getting ready to hold in the capital, has come a long way: from a small natatorium at the Sandunovskiy Pools, the only place where, at the start of the century, Moscow swimmers could train the year round; from the cold windy November of 1918, when there were not enough bread and fuel in the capital, when the hospitals were overflowing with typhoid patients and the wounded from the Civil War fronts, and the firstling of Moscow boxing was held in the Hall of Columns of the Palace of Unions; from the first All-Union Spartakiad of 1928 in Moscow, among the 7,000 participants of which were 600 guests of ours from 17 countries of the world....

It is always useful to take a look at what has gone by, not only to reevaluate what has been achieved, putting yesterday up against today, but also in order to take a look at the future, more correctly--to visualize the place of today's concerns in the overall course of our life. Muscovites, like all Soviet people, greeted with satisfaction the report that Moscow had been awarded the right to conduct the 22d Olympic Games, and from the first days they have undertaken preparations for them with enthusiasm.

In his message to members of the International Olympic Committee and to participants of the preceding 21st Olympic Games, CPSU Central Committee General Secretary Leonid Il'ich Brezhnev wrote that "the USSR has supported and will support the modern Olympic movement. Right now the Soviet people are making preparations for the Moscow Olympiad of 1980 and are doing everything possible to insure that it is held at a high level and will yield new impetus to the noble ideas of friendship and peace."

The Olympic Games are, first of all, athletic competitions, but at the same time they long have been a symbol of peaceful life and friendly ties among peoples. Peace is life, and who does not love life? Anyway, all I want to say is that for our country, which during the last war lost more of its sons and daughters than any other power, the word "peace" is especially meaningful.

In this connection, I recall the fate of Muscovite Anatoliy Ivanovich Parfenov. Since childhood he had dreamed of becoming strong and dexterous, in order to be able to conquer any athlete in honorable man-to-man combat. But the war began...In the fall of 1943, under intense machine-gun and artillery fire, the 17-year old Anatoliy was one of the first to make the assault crossing of the Dnepr, and he and his comrades held a small spot of ground until reinforcements could arrive. And a year and a half later, at the walls of the toppled Reichstag, Parfenov saluted Victory. The long-awaited peace had arrived, but its joy was darkened for Anatoliy--his rheumatic arm did not bend well....How could he wrestle with it now? But nevertheless, having cherished his dream at the front, he decided to struggle for it under peaceful conditions... From training session to training session, from competition to competition his skill grew, and in the summer of 1956 Soviet wrestler Anatoliy Parfenov ascended the highest step of the Olympic pedestal at Melbourne.

Almost a quarter of a century has passed since then. And again, this time under the arches of the TsSKA [Central Sports Club of the Army] Sports Palace, Olympic wrestling bouts will be held for the right to be named the strongest. Undoubtedly, among those who will appear on the carpet in July of the year 1980 will be a student of Parfenov's, two-time world champion Nikolay Balboshin.

It is not necessary to be a specialist to note a trend: the path to Olympian heights requires from a person ever greater efforts at each new step, ever greater concentration of will and sharpened skill. The steadily rising sports records will require of the participants of future games and their trainers, as never before, well-thought-out and effective training for the competitions. At the same time, the scale of the Olympiad is increasing in a much greater degree than the records. The statistics are extremely eloquent on this score.

The number of participants at the Olympiad-68 in Mexico, where more than five and a half thousand athletes and almost as many press representatives assembled, was unprecedented. The spectators to the competitions in those days were sold 1.9 million tickets, and, moreover, thanks to television's successes, about half a billion people watched the progress of the Olympics. Four years later these figures were exceeded at the Olympiad in Munich. More than 7,000 athletes and a still larger corps of journalists gathered for the games in the capital of Bavaria. The 3.3 million ticket holders and more than a billion television viewers all over the globe were able to observe the Olympic competitions. And the totals for the next Olympics in Montreal were as follows: 6,000 participants and almost 10,000 representatives of the press, radio and television, 3.2 million tickets sold, and 1.5 billion television viewers.

According to preliminary estimates, we expect that during Olympiad-80 a still larger number of athletes will come, plus more than 7,000 journalists and the same number of participants of the MOK [International Olympic Committee] congresses and of the international sports federations and judges of athletics. It is planned to sell more than 5 million tickets during the days of the competitions.

The Olympics are being increasingly expanded in magnitude, reflecting their growing popularity throughout the world, and they require of the country that organizes the games expenditures both for the construction and rebuilding of Olympic structures and organizational outlays and for improvement of the city's infrastructure, which should be put in order and be readied to receive a large number of Olympic participants and guests.

If Moscow's expenditures are compared with those made by the capitals of the preceding Olympiads--the cities of Tokyo, Montreal and Munich--then it should be said that the principal difference in our expenditures, which were aimed at improving the city's infrastructure, consisted in the fact that, under the conditions of planned conduct of the activity, all the appropriations for the construction of roads and hotels, the rebuilding of airports, and so on, were laid down in the five-year plan and were determined by the long-range development of the city, and our expenditures for Olympic purposes themselves were substantially less. This fact is explained by the fact that Moscow is an athlete's city. Our predecessors--in both Montreal and Munich--had to build from the ground up both the main stadiums and many athletic arenas, while in Moscow most of the structures suitable for Olympiads were already functioning, and, after some reconstruction, they will be ready to accept the games' participants.

It must be said, at the same time, that preparations for the Olympiad requires, of course, certain expenditures. There are several sources for covering these expenditures. First of all are the funds obtained from the distribution of the Olympic lottery "Sprint" and the "Sportloto" lottery. Moreover, we are conducting a fairly large commercial licensing work. What does this mean? The emblem of the Moscow Olympiad and our talisman--the likeable Mishka--is simultaneously our trade sign. If an enterprise intends to produce goods with this emblem or talisman, either inside the country or abroad, it should buy a license and obtain the right from us. It should be said: the Organizing Committee of the Olympiad takes a strict approach to what enterprises and what products can receive permission to use our trade sign. In any case, only articles of the highest quality.

An important source of income for all organizing committees, and for ours also, is the sale of television rights. The International Olympic Committee possesses the right to retransmit from the Olympic facilities to any country or any region, but it transfers this right to the Organizing Committee, which also realizes this opportunity for reimbursement for part of its expenditures. Thus, as a result of official bargaining, in which four of the largest American companies participated, the American company NBC obtained the right to conduct transmissions from the Olympic Games. By way of compensation for expenditures on the part of the Soviets, the American company paid the Olympiad-80 Organizing Committee a certain sum and, moreover, according to the agreement signed with USSR Gosteleradio, supplied us with the necessary equipment for the Olympic television and radio complex that is being built.

What induced an agreement of such a nature? On the one hand, the interest of the television viewers in the Olympiad and the striving of the companies to give television information of high quality; on the other hand, we are bearing substantial expenses associated with the reconstruction of our television facilities and we are creating the necessary conditions for television broadcasting from the Soviet Union through a satellite system. The fact is that the color-television systems of our country and some other countries, including the U.S., are not identical and additional expenditures are required so they can be linked together.

In addition to the sales of television rights, which we have sold also to other continents, there are still other sources of compensation for our expenditures. In considering the widely representative nature of the Olympic Games, many firms and companies gladly resort, for advertising purposes, to Olympic forms of cooperation, that is, they compete for the right to be named official suppliers for the games. Such companies guarantee the Organizing Committee certain advantages or discounts, or supply some portion of the product free. Of course, the main share of the equipment and stock is of our own domestic production, but at the same time we place orders with companies that produce output of the highest quality.

The program of sales of Olympic coins--gold, silver and platinum--is being realized very successfully. There is a program for Olympic brands, which also are enjoying great demand.

Obviously, we will also obtain income from receipts for stays in hotels and in the Olympic village, for the use of the services we offer, for transport and for entrance tickets to the athletic competitions....

The Olympic economic program is progressing extremely successfully, and we hope that we can be compensated to a great extent for our expenditures.

The management of the Organizing Committee for the impending Olympiad, particularly its chairman, I. T. Novikov, adopted, from the first days of preparation for the games, the policy of avoiding unnecessary expenditures, in particular, of building simply and of surprising no one with fancy architectural solutions but at the same time building soundly with a long-range aim--that the Olympiad-80 facilities will serve us both during the games and afterwards.

If one looks at a map of Moscow, at where the Olympic facilities have been sited, it will be noted that they are spread practically throughout the whole city. This is a basically new approach to organizing the structure of the Olympic complex over that of our predecessors. Both Montreal and Munich tried to concentrate to the maximum a large number of athletic structures in one place and to build an Olympic village alongside them. In Montreal, for example, they tunneled under the road that separated the Olympic Village from the park where most of the competitions would take place, and the participants in the games could go to training and competition on foot. Of course, this is extremely convenient for the athletes during the Olympic Games. But then?....Such a concentration of structures will hardly prove to be desirable in such a large city. It happens to be dense here, vacant there. Therefore, it was decided to spread the athletic facilities throughout all of Moscow. This, of course, will cause us some bother during the 15-day competitions, but, when the Olympiad is ended, there will be scarcely a rayon of Moscow that will not have an excellent sports center.

As I have already remarked, most of Moscow's Olympic sports structures were built a comparatively long time ago, and needed only to be rebuilt. The concept of reconstruction is very inclusive, it implies not only cosmetic repair and an expansion of subsidiary premises and the services sphere, but the main thing is the technical reequipping of our sports facilities. The fact of the matter is that the density of the data of the competitions at present is extraordinarily high--at times not meters but literally millimeters will separate the victor from the vanquished. It is necessary to perceive not in seconds but in tenths or hundredths of a second, or even in thousandths of a second in order to be able to determine the best time or results for distance every time. In the arsenal of the judges' measuring apparatus is the laser, television and computer equipment. Thus, we are equipping our athletic structures with new, modern judging and measuring apparatus so they will meet the most modern requirements.

Simultaneous with this process, the reequipping of information resources is going on. In addition to the main press center on Zubovskiy Bul'var, which gives the journalists good working conditions, each sports structure will have its own operating press subcenter. A journalist thus will be able to transmit to his country not only from a given facility but, switching on the television monitor, he will be able simultaneously to see what is occurring at certain other arenas of the Olympics and to comment at once on several competitions.

Right now a rather paradoxical situation prevails: the viewer, sitting before his television screen at home will have more information about the competition than the fans who are at that moment in the sports arena itself. For television is able to repeat the most interesting moments of competition, and it has at its disposal, finally, the slow-motion feature. The viewer at the stadium is deprived of all this. The creation of matrix display boards that show an image not only in the form of letters and numbers but also "draw" a moving picture in color, greatly intensifies the visual effect at the stadium.

Such a matrix board was used at an Olympic stadium for the first time in Montreal. It was manufactured by the American company Conrad. At the close of the Olympic games, members of the Soviet delegation became witnesses to a singular turnover of the relay baton from the organizers of the Montreal games to the organizers of the games in Moscow. At this time a television circuit was established and the ceremony of acceptance of a symbolic relay baton at Red Square (with the participation of Russian girls in national dress) was shown on the matrix display board; and to all of us who were at the Montreal stadium it was as if we were direct witnesses to this sports ritual. These days it will be possible to show on the Olympic matrix display board any images that are put at the disposal of the games by television or motion pictures. Our main sports arenas are now equipped with this apparatus.

The main stadium of the Olympics will be the Stadium imeni V. I. Lenin. The ceremonial opening of the games will be held on 19 July at 1600 hours, the ceremony that closes the 22d Olympiad will be held on 3 August at 2030 hours. All types of track events, the final events for football and equestrian sports (playoffs for the "Prize of Nations") will be held at this stadium. The jiu-jitsu men and gymnasts, volleyball players and water polo players will appear in other sports halls and natatoriums of Luzhniki.

The second large complex of Olympiad-80 in Moscow is Krylatskiy Rayon. Here on the rowing canal, one of the finest in Europe, participants of the competitions for all types of rowing will start: conventional, kayak and canoe. Not far from the canal is a field for archery and a silvery "foundation pit" for bicycle racing. For the first time in the history of the Olympics the bicycle racers will have a track that will not depend upon weather conditions, being covered by Siberian larch beams. Here also, at the Krylatskiy Rayon hills, a very complicated circular bicycle track of increased difficulty has been built. Not far from here, on Minskoye Shosse, on 20 July, the first gold medal in the 100-km road race will be won.

The next large sports complex that we are building for the Olympic Games is situated not far from Prospekt Mir. Here are found a natatorium that accommodates 18,000 spectators and the largest covered stadium in Europe. The architects of the latter facility faced a complicated task--to build in a short time a building that would be beautiful in its exterior, reliable in operation, and comparatively simple to build, to be more than 220 meters long and 180 meters wide; and to erect on a building of such enormous area a roof without any supports that would be in the spectators' way. Unlike the designers of previous Olympiads who faced such problems, a collective of our scientists, architects and designers made the idea of a stretched membrane the basis for the design of the stadium's cover. A single roof made of steel sheet only 5 mm thick will become the ceiling for the football field and the stands for 35,000 spectators; hockey games and competitions for skaters and track athletes will be held here.

The architects used still another innovation in this structure--when necessary, the stadium is partitioned in two by a movable metal curtain. Thanks to this sound-absorbing partition, during the Olympiad basketball players and boxers will be able to compete in the premises of the covered stadium at the same time without interfering with each other in the least. Later, it will be possible to conduct meetings and concerts here, occupying the whole area, when the building will accommodate up to 45,000 people.

This stadium has a normal football field on which to play the year round. (In speaking about the causes of their weak game, our football players often refer to the lack of such fields. Let us see what kind of excuses they will think up when the covered stadium goes into operation.)

It is expected that in July 1980 Muscovites should accommodate simultaneously an enormous number of Soviet and foreign guests. Never before has our city received such a number of arrivals, which will make it necessary to provide not only comfortable housing and diverse foods but also all other forms of modern services, including motor-vehicle servicing and the parking of a large number of motor vehicles, precise communications over many international channels simultaneously, and the organization of leisure time for hundreds of thousands of people....

Hotel capacity has for many years been a bottleneck for the capital city's activity. At one time this gave certain members of the International Olympic Committee cause to doubt that Moscow could receive and provide everything necessary for the large number of guests and tourists. In other words, whether the city could, in a comparatively short time, multiply its hotel capacity by more than one and a half.

Right now we have practically fulfilled this task. In Izmaylovo, not far from the Serebryanyy-Vinogradskiy ponds where, according to legend, Tsar Petr arranged fisticuffs for his amusement, the framework of the country's largest hotel complex of the AUCCTU for 10,000 guests has been thrown up. The 27-story Kosmos Hotel, across from the central entrance to the VDNKh [Exposition of Achievements of the National Economy], has been turned over for operation. Soviet and French architects worked out the design of this high-rise building jointly. When the Olympiad opens, the doors of the

Tourist Palace on Leninskiy Prospekt, hotels in the areas of Volkhonka, Troparevo and Kakhovskaya subway station and new motels and camping grounds will be thrown wide open. In all, 20,000 guest accommodations will have been added in Moscow during the Tenth Five-Year Plan. Student dormitories will be used widely for accommodating tourists.

Finally, I will tell about what is especially close to me--the Olympic Village, which is being built behind the Moscow State University imeni M. V. Lomonosov, in the region of the Yugo-Zapadnaya Subway Station. Well, first of all, why a village?

At the 1932 Olympiad the athletes were for the first time accommodated in cottages specially set aside for this purpose, from which a settlement was formed. Someone christened the settlement the Olympic Village, and the name stuck, as did the tradition itself: to house all the game's participants--the guests and the hosts--as "one family" in one place, which answers completely the spirit of the Olympic Charter.

The 1980 model Olympic Village is a small autonomous city that rose up on the same spot where, not so long ago, the hovels of the village Nikol'skoye were pressed against the ravines. When we began to design it, first we wanted to organize a complex that would give the games' participants practically everything needed for their sojourn and for servicing them within the village itself. Second, in our view, the Olympic village should be built to consider the fact that all its structures will be capable of serving city residents for a long time, similar to a housing microrayon of Moscow. Finally, we wanted to see the Olympic Village as practical and inexpensive, so, during its erection, maximum use was made of ready-made design solutions. We did not go to useless, vain expense.

Our Olympic village consists of three zones: international, auxiliary and residential. In the international zone is the building of the general director, a bank and a post office. The large complex will become the cultural center of the Olympic Village. Here one can enter the main theater, which seats 1,200, two cinema theaters that seat 250 each, a library of foreign literature, a discoteque, a ballroom, a restaurant, a television room, a room for pinball machines, and premises for interviewing athletes.

The Olympic Village Cultural Center's operating program will include performances of our best vocational collectives, such as the Berezka dance ensemble, I. Moiseyev's ensemble of national dance, S. V. Obraztsov's doll theater, the Soviet Circus, a ballet, and performances of artists and ensembles of all the Union republics. At the service of the Olympians will be museums, a picture gallery and monuments of architecture and of the history of our country. And I hope that the Olympians will take from Moscow not only memories of how Olympic battles were fought but also very good impressions of our capital's hospitality, Muscovites, and the Soviet people.

The organization of catering in the Olympic village is a very complicated and important matter, for it is a necessary element of preparing the athletes for the competition. When an athlete has finished the performance for his team, then that is another matter; he can try one dish or another, to give due attention, let's say, to the Russian national cuisine. But when a participant of the games is getting ready for competition he should receive the food to which he has been accustomed for the 3 or 4 years of his training for the Olympiad. This is a mandatory prerequisite. At the same time, in organizing catering in the "Village," it is impossible not to consider national preferences and restrictions. This is why the menu that we have been working on for a long time, jointly with staff workers of the Institute of Nutrition, the main administration of Mosobshchepit [Main Administration for Public Eating Facilities] of the Moscow City Executive Committee, and other specialists, is quite complicated. It includes 360 dishes, which are not repeated once during the course of the whole Olympic Games and, moreover, 100 additional dishes. This assortment will enable each athlete to choose his own food.

In addition to the dining-hall restaurants for 4,000 persons, also at the service of the Olympians are the Russkiy Chay tearoom, a cafe and ice-cream parlor, and a milk bar. In the same complex with the nutrition block are stores where trade in souvenirs, books, flowers, newspapers and magazines will be conducted.

In the Palace of Personal Services the athletes will be able to repair clothing, footwear and sports goods, as well as watches, motion-picture equipment, and leather and metal haberdashery; here also will be found a photographic studio and pick-up points for drycleaning and ironing.

The sports complex of the Olympic Village includes three covered general-purpose halls and a natatorium with three pools. The depth of the main pool is unusually great--8 meters. But the "excess" is not accidental. In the future the Moscow Children's Sports School for Diving will be opened up here. Moreover, on the village's grounds are three limbering-up football fields, a stadium with running tracks and sectors for track and field athletics, basketball and volleyball courts, and a sauna. It should be noted that the main purpose of the complex is not training, for which other places have been set aside, but for the athlete's recreation and limbering up.

Ravines surround the Olympic Village. They are now being improved, and a green belt and a cascade of ponds that will be filled up with water by the small stream, the Samorodnika, which flows here, are being created.

The housing zone of the Olympic Village begins with the Square of Nations--where the ceremony for opening the Olympic Village and the official presentation of teams will be held. There is this tradition: soon after a team is billeted in the place assigned to it, it goes to the Square of Nations. The Mayor of the Olympic Village greets the team and hands it a symbolic key to the Olympic Village, the hymn of the country is performed, which the athletes present, and the flag is raised. Flagpoles for all the nations participating in the Olympic Games have been set up at the Square of Nations.

The housing zone proper has been presented with 18 housing buildings of 16 stories each. The houses are of the serially produced type which are being built not only in the Olympic Village but also in many other areas of Moscow, so there is nothing especially Olympian about them. The apartments in the housing are of two types: two- and three-room units of 32 and 48 square meters each. Two athletes are accommodated per room. Conditions, it must be said, are rather good.

At one time the Organizing Commitee held a competition among furniture companies for supplying everything that is necessary for the Olympic Village. Well-known companies from Finland, the FRG, Poland, Yugoslavia and the Soviet Union participated in the competition. The Soviet furnituremakers won. USSR Minlesprom and the Inter'yer company, and the Institute of Furniture prepared a set of furniture for the housing premises and the team staff apartments to which the competitors, the other companies represented at the village, unanimously gave the palm of preeminence after examining it.

The accommodation of athletes in the Olympic Village is a rather delicate matter. It is necessary here to consider very many factors, primarily the size of the teams. We want each team to receive maximum privacy and opportunity for good rest. On the other hand, the traditional national interrelationships among people and other peculiarities had to be considered. We did well in accommodating the teams, in my view. In any case, those national Olympian committees with which we have met, and these number more than a hundred, did not express special comments on this account.

There is also a polyclinic in the housing zone of the Olympic Village. Its seven-story building is a standard rayon polyclinic, and this is what it will be after the end of the games. During the Olympiad we shall begin to use four kindergartens and two intermediate schools not for their end purpose; servicing personnel and storage premises will be located here, but when the games are over, then, of course, both the kindergartens and the schools will serve Moscow's youth.

Generally speaking, when our guests leave, the reorientation of the Olympic Village will occur rather quickly: the furniture will be moved from here to equip dormitories and hotels, cosmetic repairs will be made to the apartments, and Muscovites will be able to come into this residential microrayon this year.

The activity of the Olympiad's Organizing Committee and, particularly, the work of creating the Olympic Village, has been constantly eyed by Soviet and foreign journalists, sports agents and many other people who are following with interest the progress of preparations for the games in Moscow. During the 7th Summer Spartakiad of Peoples of the Soviet Union, we invited 908 delegations. They became acquainted with the concept of establishing the Olympic Village and with its progress in preparing for the games, and they examined the standard apartments.

The President of the MOK, Lord Killanin, gave a high appraisal to our work. He said, "The Olympic Village being erected in Moscow will create maximum convenience for the athletes. They are among the best structures of this type in the whole history of the Olympic Games."

An amusing episode occurred that involved me and a representative of the International Olympic Committee. At one of the meetings she suddenly asked me:

"Tell me, Mr. Kholod, will there be windows in your village?"

"A somewhat strange question," I thought, and I suggested to the guest that she herself examine the village. Soon she came, she looked at everything extremely attentively and was satisfied. I could not refrain from a remark:

"Madam, as you have become convinced, there are not only windows in our village but even balconies."

Bursting out laughing, she answered:

"As a matter of fact, I just found out recently: in the Olympic Village of Lake Placid there were no windows in all the rooms."

The Olympic Village of Lake Placid in the USA was conceived and built as a future jail, so it was not accidental that certain premises in it did not have windows, and on the whole the conditions for staying there provoked sharp criticism on the part of the managers of national Olympic committees. Many of them spoke to me about this at the time of the meetings, comparing our village with the American one.

A Canadian journalist from Toronto wrote recently: "Even the journalists who are most clever at innovation will not think of a more paradoxical situation than that which arises in 1980 in connection with the conduct of the winter and the summer games. At a time when the leader of world capitalism, on meeting participants of the White Olympiad with drum beat and fanfare, sends them directly to...jail, Communist Russia places thousands of athletes in convenient, simply splendid apartments, which, upon conclusion of the games, will be turned over free to the possession of Muscovites."

I once happened to work as an engineer at a sovkhoz and to have been a Komsomol worker and first secretary of a party gorkom. Everywhere, obviously, the responsibilities were in their own way diverse and complicated. However, my work these days in the role of general director is surprisingly nonstandard. Everything that we, workers of the Olympiad-80 Organizing Committee, have encountered, we are doing for the first time. We have no reliable examples of what has been done, and because of this we have been deprived at times of the possibility for the customary discussions: "But you know, at one time, someplace, such and such a solution 'worked'; why don't we adopt it?" Of course, there is the experience of our predecessors, and we are using it widely, but to transfer this experience mechanically from country to country is impossible, and for us, people of a completely different social world, to do so would be even more complicated, because many problems that we encounter are entirely different from those, let us say, that are encountered by representatives of the capitalist West. On the other hand, certain procedures and the traditions of the games and of the Olympic Village, which we had to consider, have prevailed. At the very end, there are the numerous requests and desires of the managers of delegations, and sometimes, it is true, they are mutually exclusive, but they also must be kept in mind.

Here, it would seem, is a most simple problem: the creation of conditions for the recreation and lesiure time of the Olympians. But how many nuances there are here! Let's say, how to combine the interests of athletes living together, whose psychologies are extremely different? Some, before an important appearance, must have solitude in order to concentrate and prepare themselves for victory. Others, on the contrary, want to be diverted from thoughts about the responsibility of the next day, to relax. Moreover, alongside those who have completed the games and are celebrating victory or are surviving a lack of success, are those still waiting to start. How to find an optimal variant here?

When I was proposed for my current post, I obviously was unaware of even a tenth of the "submerged rocks" that I would encounter later on. But still this work has, of course, been very absorbing. All the more so since it was dedicated to such a rewarding business as the Olympic Games, and to sports, which have been a favorite pursuit of mine for my whole life.

I was born and grew up in a rather obscure hamlet in Belgorodskaya Oblast, where, as it is now customary to say, the base for engaging in sports, especially then, in the postwar years, was, of course, desperate. During the war the front rolled through us twice, so the problem of where to live was the main problem.

But nevertheless, I and my comrades, after dragging two poor downed posts (and in the steppe these are valuable, I'll say!), we built a volleyball court, and then a football field, where we spent all our free time.

The school at which I studied was 5 km from the village, and since, at that time I and my friends were literally obsessed with sports, from the eighth to the tenth grades I did not walk to my studies but ran. I ran in the rain and in the snow, in high boots and in felt boots. This led me to a love for the middle distances--5 and 10 km, at which I was mainly fairly successful, and I did run in races. I did not become a great master of sport; in the institute, Komsomol work took hold of me in the first class, but a love for athletics has remained forever.

This also was one of the factors that led me to the Organizing Committee for Olympiad-80, into one of the most complicated of its subdivisions--the Olympic Village, which will serve personnel and which these days is doing everything possible to support conduct of the games at a level worthy of the capital of the world's first socialist state.

We await the guests. Be our guests, Olympic athletes!

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Kiev's Preparations

Kiev STROITEL'STVO I ARKHITEKTURA in Russian No 3, Mar 80 pp 1-4

[Article by P. Ye. Yesipenko, Deputy Chairman of the Ukrainian SSR Council of Ministers and Chairman of the Ukrainian Republic Organizing Committee for Olympiad-80: "Olympic Ukraine"]

[Text] The decision of the International Olympic Committee to conduct the 22d Olympic Games in the Soviet Union in 1980 is bright testimony to the growing prestige of our state in the world arena and its vast achievements in the areas of economics, science, culture and social development.

In organizing the worldwide holiday of sports, youth and friendship, the Soviet people are experiencing a legimitate feeling of pride in the fact that the Olympic Games will be held in our country for the first time, in the motherland of the October Socialist Revolution, where Olympic ideals not only are proclaimed but also are actually implemented.

Along with all the republics of our country, the Soviet Ukraine is preparing to greet participants and guests of the all-world sports form worthily. Under the leadership of party and soviet organs, the work of the Olympiad-80 organizing committees of the republic and 25 oblasts has been aimed for almost 3 years at implementing an integrated plan of preparation for the Olympic Games. This plan calls, in particular, for the execution of enormous amounts of work in the construction and rebuilding of sports bases, hotels and roads and improvement of the republic's cities and villages.

Thanks to daily contacts of the builders with the designers, architects and the collectives of many industrial supplying enterprises, many interesting design, architectural and engineering solutions were adopted during implementation of the integrated program of Olympic construction and major technical difficulties were overcome. All this includes in the greatest degree the Olympic facility--the Republic Stadium in Kiev--which was approved by the International Olympic Committee as one of the arenas for the Olympic football tournament.

The design for reconstruction of this stadium, which was developed by the Kiev Zonal Scientific-Research Institute for Experimental Design, had still another purpose--to convert it into the republic's main Olympic base. This explains the enormous scale of construction and reconstruction over the whole stadium grounds, 36 hectares in area. Here are some figures: earthmoving work was carried out in the amount of 150,000 cubic meters, 10,500 cubic meters of cast-in-place and 7,500 cubic meters of prefabricated reinforced concrete were placed, 12,500 cubic meters of masonry, about 300 km of cable for electric power and for weak-current networks and more than 10,000 meters of heating conduits, water-supply and sewer grids were laid, 1,535 tons of metal structure were manufactured and erected, more than 15,000 meters of piles were driven, and large numbers of other operations were carried out.

Forces of Moscow, Sukhumi and Kiev specialists at the football arena created a new multiple-component soil-and-vegetation layer. The precise leveling of the field, which was done by means of a laser sight, the execution of the main operations in short periods of time, the timely sowing and top dressing of specially selected grasses, and careful maintenance of the grass plot enabled FIFA [International Federation of Football Associations] experts to give the football field a high assessment in 1979.

Reconstruction of the stands of the lower tier entailed no few difficulties. The special reinforced-concrete preparation over the whole slope and construction thereon of prefabricated corrugations under the seating which the design called for could be considered the most rational variant only where all the concrete work is performed by the mechanized method. Large "dead zones" under the upper tier's overhang to which the crane could not deliver concrete mix prevented this. The creative collaboration of staff workers of the Scientific-Research Institute of Construction Operations, which adapted a pneumatic spatter method that they had previously developed to local conditions, SU-17 [Construction Administration No 17] of Kievgorstroy-4 [Kiev City Construction Trust No 4], and Kievorgstroy workers, who used light metal stock formwork during the concreting, and also the originators of the design, who changed the foundation slabs partially for this purpose, were of help.

One of the most important requirements for the Olympic stadium is that of providing for rapid seating and evacuation of spectators. For this purpose three new staircases between the sectors were erected, the previously existing aisles were widened, and new aisles were built in the enclosure on the upper ring of the alley.

Much work has been done to provide for a constant and reliable electrical supply for the stadium. The system of floodlighting for the football field was completely updated. The architecture of the grand 82-meter posts, with sail-shaped multiple-section illumination installations, provokes various opinions, but the strength of the structure and its reliability are beyond doubt.

The posts are made of thin-walled metal membranes that were developed by Ukrproyektstal'konstruktsiya [Ukrainian Institute for the Design of Steel Constructional Structure]. Assembly was done with consolidated units. The 12-15 meter sections of 25-30 tons each, with staircase and platforms installed, were raised by means of heavy MKG-63 crawler cranes and a 100-ton MKG-100 crane.

New domestic halogen-metal lamps of 3,500-watt capacity, which have an arrangement for instantaneous relighting, are used in the floodlighting equipment structure, which was manufactured by the Ternopol' association Vatra. The Saran' Electric-Light Plant produced these lamps specially for the Olympiad. The 560 projectors provide an illumination field of 1,300 luxes per square meter, which is required for high-quality presentation of colored television transmissions. The projector and outside illumination are controlled from an automated control panel.

Preparation for the Olympic tournament required improvement in the organization of athletic medical services. For this purpose, a recovery and diagnostics center for 250 patients per day, equipped with the newest medical equipment for performing various procedures, diagnostics study and prognoses of an athlete's potential, was built behind the western stands.

An object of legitimate pride for the designers and the builders is the central stands, with the information-reporting complex erected above it, which is crowned by a 10-meter emblem of the 22d Olympiad. Guest boxes, which consider all the Olympic requirements and traditions, were constructed in the stands. And the Olympic press center has been equipped in appropriate fashion. Booths for commentators are equipped with the newest panels for simultaneous conduct of reporting by radio and television, and also for holding technical communications with the main press center in Moscow.

One of the booths has a circular field of view. It was intended for an operator, who gives, at the order of the judges and producers, the program of text and material or illustrated information on the new electronic display board that was installed and equipped with the help of the Hungarian firm Elektroimpeks--one of the official suppliers for Olympiad-80.

Workplaces for 88 correspondents and 15 television and radio commentators have been equipped in a glassed-in box. For services for journalists, there are halls for press conferences, teletype equipment, a press bar, a photographic laboratory, a telephone trunk-call office, and a room for duplicating equipment.

In order to provide for high-quality television and radio transmissions, special substations and 12 platforms for the installation of television cameras have been built in the stands and directly on the field.

The emblem above the information and reporting complex that was installed at the end of last year would seem to mark completion of the main construction and installing operations for reconstruction of the stadium. This honored Olympic job was carried out by the Brovar Metal-Structure Plant of UkSSR Minsel'stroy [Ministry of Rural Construction].

On the second tier of the opposite stands there recently appeared another Olympic symbol--the cup for the Olympic flame, 3.5 meters in diameter, set on an 8-meter support. The special medium-pressure gasline that provides for normal burning of the torch, which was designed by the Gas

Institute of the UkSSR Academy of Sciences, was connected to the cup. The torch preserves the flame during the most unfavorable atmospheric conditions.

The upper sports nucleus of the stadium has been changed beyond recognition. Already for almost a year now the republic's best athletes have been training for all the game-type sports and for weightlifting in a two-hall pavilion that was built here and is equipped with medical offices, dressings rooms and rest.

Much attention was devoted at the stadium to organizing eating and shopping enterprises. A central shopping pavilion with a warehouse has been built, a network of extension-type pavilions based on a ring alley and the areas in front of the stadium have been equipped, and a multitude of portable booths was called for.

New facilities for municipal services have been erected and old ones rebuilt. They are of modern architectural form, have been faced with high-quality and long-lasting materials, and have been equipped with the newest plumbing and ventilating equipment.

Everything at the stadium has been made so that not just for the Olympic period but for many years later, athletes and spectators will be able to feel the unity of nature with the attractive, elegant and, at the same time, rational and durable structures. Therefore, during reconstruction wide use was made of natural materials: granite, Al'ma stone, marble and wood, as well as glazed tiles and aluminum.

The artistic and decorative appearance of the stadium also was considered for a long time. The color spectrum of elements of the central core, the information signs, the box-shaped structure for the photographic exhibits, the decorative vases, the flower beds, the grass plots, the openwork fences, and the flagpoles were carefully thought out and carried out.

The accomplishment at such facilities of technically complicated and mutually related operations that were carried out by tens of general contracting and subcontracting organizations was possible thanks to the correct assignment of forces and the use of modern methods for planning and control, which enabled the human and engineering resources to be manipulated.

Based upon a design for organizing construction that was developed by KievZNIIEP [Kiev Zonal Scientific-Research and Design Institute for Standard and Experimental Design], NIISP [Scientific-Research Institute for the Construction Industry] made up a detailed integrated critical-path schedule and, accordingly, schedules for each facility, that called for the fulfillment of tasks by the flow-line method.

The experience, creative approach and initiative of leading construction and design specialists and the managers of a number of supplying enterprises played a major role, which in the final analysis provided responsive solutions for the most complicated technical, engineering and organizational problems.

The building of the comfortable Hotel Rus', for 800 guests, which was built according to a KievZNIIEP design, was inserted organically into the architectural ensemble that was formed by the facilities of the Republic Stadium and the Sports Palace. The high-rise part harmonizes well with the stilobate part, in which a restaurant and cafe for 1,200 persons, a hairdresser's shop, a communications section, and stores and kiosks for sales of souvenirs, newspapers and magazines have been placed. The hotel has 11 high-speed elevators (8 of them for passengers) and a centralized system for engineering services.

The interiors are finished with ceramic wall panels, monumental-type decorative compositions, and a large tapestry with an ancient Russian theme. The hotel complex includes a bowling alley equipped with the newest equipment and automatic pin-setters. Flagpoles have been set up at the entrance for the flags of the countries that participate in the football tournament and for the Olympic flag.

After the Olympiad, reconstruction of the stadium will enter a concluding phase. A track and field facility with a large-span pliated roof, a covered four-pool natatorium, and a hotel for athletes that accommodates 315 guests, stands, and a judges' box for the trampoline, which the design calls for, are to be constructed. All these facilities are necessary for the Republic Stadium if it is to obtain the right to conduct the largest international competitions not only in football but also in other types of sport.

Much has been done in Kiev to rebuild the stadiums that are intended for conducting studies of and for training Olympic soccer teams. The Dinamo, the republic's oldest stadium, will accommodate 16,000 spectators after reconstruction. In accordance with a Kiprograd (State Institute for Urban Design) design, instead of earthen stands, new reinforced-concrete stands based on site-cast piles were erected, the field has been repaired, the number of running lanes has been increased, guest stands have been built, on-site utilities networks have been laid, the evacuation routes and personal-services premises have been enlarged, and artificial illumination with floodlighting poles and an electronic scoreboard have been installed.

At the Spartak Stadium concrete stands for 3,000 spectators and premises under the stands have been constructed, sports halls have been rebuilt, and new electric-power and low-voltage networks have been laid. Here, as at the four other training stadiums, much still remains to be done to make it a physical training center for athletes of several types of sport and a place for conducting large-scale agitation, propaganda and spectator measures.

Much work has been done by staff workers of Sportproyekt (Institute for the Design of Sports Facilities) and by collectives of Kievgorstroy-7 and other organizations to create in the city's green zone--Koncha-Zaspa--the largest Olympic study and training base in the republic. On limited ground, the designers managed to place compactly and in original fashion a five-hall complex with a restored diagnostic center and hotels designed for the simultaneous occupation by 420 athletes.

The total area of the halls for gymnastics, sports games, weightlifting, wrestling, and boxing is 5,700 square meters. Using 18-meter steel trusses as lateral structure to support the ceiling-floor of the upper story, the designers created in the 4-story unit halls 30 meters long without interior supports. The trussed story, 3 meters high, is used for the conduct of study classes for various Olympic types of sport. Members of the country's all-star boxing team that trained here prior to the trip to the European championships in 1979, who were the first tenants of this base, noted its esthetic and technical perfection.

An artistic wall paneling in front of the buildings, the aluminum glazing of the main entrance and the sports halls, the facades and socles faced with Al'ma stone and slag crystallized glass sheet, the vestibule walls, which are made of coquina, the floors made of granite slab and marble breccia, and the suspended aluminum ceilings--all this, in combination with modern engineering and sports equipment, has transformed the republic's Olympic base into one of the best sports centers in the country.

Another structure original in concept that will serve to train athletes of high class is a covered sports arena that is being constructed in the UkSSR VDNKh [Exhibition of Achievements of the National Economy of the Ukrainian SSR] area. Together with the complexes of the Ice Stadium and the Republic Hippodrome, it will form an impressive architectural ensemble. The designers have employed experience in the construction of similar structures in Moscow and Leningrad. The arena's volume is formed out of 11 large three-dimensional structural modules each 6 meters wide, and steel beams 78 meters in span are used for the roof, the excellent proportions of which, despite the great size, create an impression of lightness and elegance.

The playing court will be on the second floor, and the stilobate part houses a vestibule for a box office and spectators and premises for utilities services and equipment that will enable the football arena to be transformed from artificial turf for competitions in other types of sport.

The Ice Stadium itself, which opened its fourth sports season last winter, is also an important sports structure and an interesting engineering solution. Giprograd designers, for the first time in domestic practice, applied here a basically new method for laying the foundations for an artificial running track. The reinforced-concrete technological slab, on which the ice is frozen, is made without joints,out of self-stressing NTs-grade cement. Deformation forces from the difference in temperatures are eliminated, thanks to the structure, with rocking supports and the sliding graphite bed on which it is situated, that supports the slab.

The high quality of the ice of the artificial race track and the system for automatic control of the complicated engineering activity of the stadium make it among the best open-field skating rinks in the country.

Among the facilities necessary for training future Olympians that are located in the center of the capital's new housing tract--Bereznyaki--is the track facility for the School of Higher Sports Mastery of the UkSSR Sportkomitet [Committee for Physical Culture and Sports under the UkSSR Council of Ministers]. Almost 300 athletes will be trained per shift in its halls. With the introduction into operation of the closed natatorium called for by the design, the facility will become one of the bases for Olympic training for the pentathlon. The spacious lighted building, which has been built in a spartan manner, fits well into the surrounding landscape, and the architecture of the building and the elements of the amenities were subordinated to solution of the park area in which the facility is located.

The Olympic training bases for summer and winter types of sport that have been established in Khar'kov, Alushta, Feodosiya and Vorokhta will help to raise the level of skill of athletes.

Not only in our country but also abroad, the All-Union Ikho Natatorium Center, which was built in Khar'kov by Trust No 86 of UkSSR Minpromstroy [Ministry of Industrial Construction] in accordance with a design by Soyuzsportproyekt [All-Union Institute for the Design of Sports Structures], is well known not only in our country but also abroad. Excellent conditions have been established in the center for the training of and competition among athletes. The Spartak natatorium of this complex, which has a 50-meter pool, with special lanes that absorb waves, is one of the best in Europe.

Although the sports facilities are the main component of the comprehensive program of Olympic construction, it is not limited to them. Tens of hotels, restaurants, cafes and stores are being rebuilt in the republic. The Yalta, the largest hotel complex in the Crimea, for 2,600 guests, the Hotel Mir for 500 guests in Khar'kov, and the Zakarpat'ye in Uzhgorod for 400 guests were recently put into operation. The recently constructed Inturist in L'vov, for 340 guests, is an example of a successful, original and, at the same time, economical solution.

The youth cafe Olimpiada-80 on the left bank of the Dnepr is enjoying great popularity on the part of Kievans and guests of the republic's capital. Everything here has been keyed to Olympic symbology--the walls of the small hall are decorated with stampings that reflect the athletic life of a village in Greece, and the large hall is reminiscent in form of a stadium.

Many other facilities--the railroad station in Kiev, the passenger port terminal at Odessa, the international sector of the Borispol' airport, and a number of bus stations are being rebuilt or greatly renovated. A railroad station is being built in the border town of Chop, and reconstruction of the Shegini, Porubnoye, Chop and Uzhgorod traffic-control points, which have a modern architectural aspect and are equipped with the newest technical equipment, is being completed.

The republic has already prepared 114 hotels, dormitories, motels and campgrounds, 270 restaurants, cafes and dining halls, 29 technical servicing and 130 refueling stations for motor vehicles, a large number of personal services enterprises, hospitals, polyclinics, communications facilities and cultural institutions to serve Olympiad participants and guests. About 900 km of road on the route of the Olympic flame and on tourist routes have been repaired, rebuilt or improved.

Considering that in July and August of 1980, hundreds of thousands of Soviet and foreign tourists will be passing through the Ukraine, a large proportion of whom will be taking excursion trips, the republic's Organizing Committee set before the appropriate ganizations and enterprises the task of imparting to the whole republic a festive appearance that will conform with our people's traditional cordiality.

In accordance with the integrated plan for artistic-decoration and for advertising and information signs that was approved by the Organizing Committee, the Kievgoroformleniye [Kiev City Production Association for Public Signs], in collaboration with GlavAPU [Main Architectural and Layout Administration] of the city ispolkom, developed unified elements that include traffic signs with Olympic symbols, printed panels, general-purpose exhibit structures, and outline maps of the city showing the location of Olympic facilities. At Kiev's large squares, photographic exhibits on the Olympic theme will be built. Automatic illuminated information facilities, which will help guests to orient themselves within various microrayons, will be created. For this purpose, sports and personal services pictograms are being used widely. A large portion of them are being made in accordance with the designs of Moscow organizations of the Swiss firm Intertekst, which is an official supplier for the Olympiad. Similar work on the amenities and appearance is being conducted in all the republic's oblasts, mainly those through which the Olympic flame will be relayed.

Local organizations are widely using KievZNIIEP design suggestions for signs for roadside hotels, restaurants, cafes and dining halls, rest grounds and pavilions, scenic grounds, repair facilities, buffets with tourist kitchens, summer houses, wells, springs and other places for common use. The specifics of tourist routes, national traditions and people's motifs have been considered in the artistic and architectural solutions for elements of the amenities, as well as the potential for manufacturing these elements from standard reinforced-concrete structure and decorating them with local materials.

This is how the architectural and construction panorama of the Olympic Ukraine is being prepared for the unusual and joyous event--a sports holiday that brings people together. Soon, quite soon, at the facilities where the last preparatory work is being done, captions will appear in the main languages of the Olympiad with the words, "Welcome!"

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'Olimpiyskiy' Stadium

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Jun 80 p 4

[Article by L. Leonidov: "The 'Olimpiyskiy' Is Receiving Guests"]

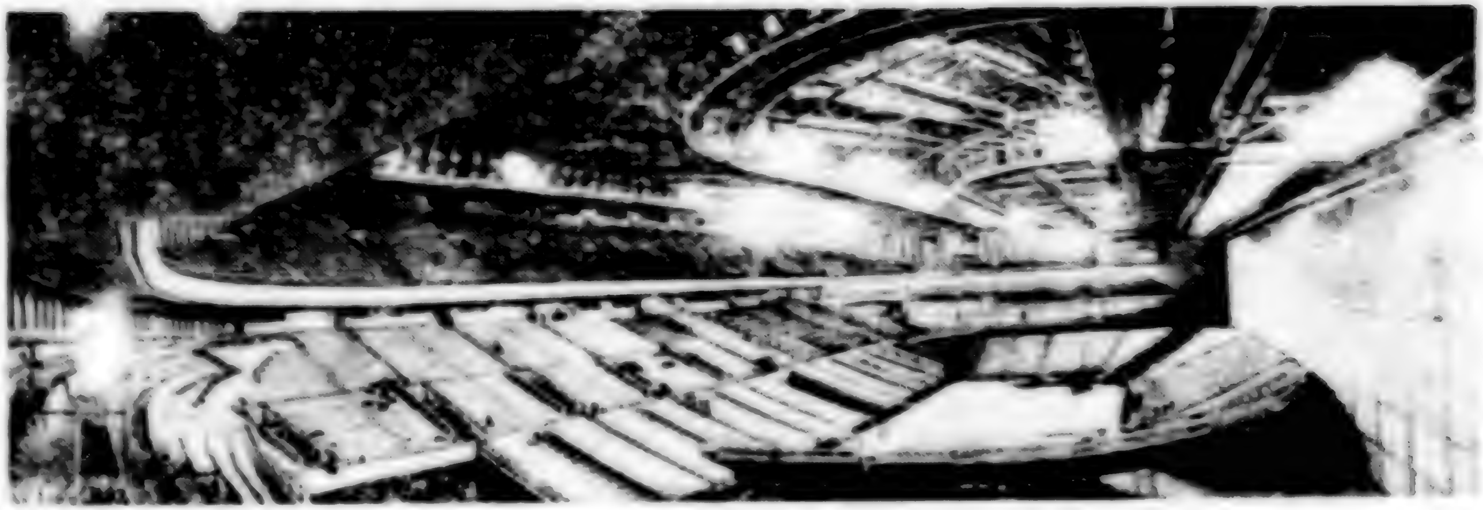
> [Text] Today, after having changed everyday attire for holiday garb, they are becoming the first spectators at the covered stadium, the largest in Europe and one that has no counterpart in the world. And they occupy this place by right. These are the hands that erected the remarkable Olympic structure.

Yes, today, at 1400 hours, a sports complex that is unique in many regards was opened up. The name given it--"Olimpiyskiy'--is resounding. All the Olympic-80 facilities are expressive, and each is interesting in itself. But still not one country has a center similar to that which has been raised up on Prospekt Mir--a covered stadium for 40,000 spectators and a natatorium.

Only a bit more than 3 years in all were required for the mass of the Olimpiyskiy to rise up on the site of old alleys, 300 dilapidated structures and the small Burevestnik Stadium. In so doing, more than 6,000 people were resettled in new, well-appointed apartments. The construction was conducted simultaneously with the release of the grounds, and the design work simultaneously with both the one and the other.

You look upward and you feel that overhead is...the sky, the transparent dark blue of a clear summer day. This is the basic color range of the complex. There is nothing to hold up the "firmament." For the first time in construction practice, success was achieved in roofing an arena of such size with a membrane without any kind of intermediate supports. Here are both the economy and boldness of the solution and its originality.

The capacity of the stands is impressive. But does every sporting or some other kind of event draw such a mass of people? Of course not. A way out was found. In just a few minutes, the arena is transformed, becoming half its size, and, when convenient, it is returned to its original appearance. A bulky panel as high as an 8-story building and a meter thick moves by means of a slotted guide along the guide of an unseen frame. The soundproof wall completely partitions the hall. Two autonomous "minihalls" are formed. At the time of the Olympiad 16,000 spectators will watch basketball matches in one of them and 17,000 will be witnesses to boxing bouts in the other.



A Hall of 'Olimpiyskiy' Stadium.

And here is a curious fact: at the Olimpiyskiy Stadium competitions can be held for 28 types of sports. And it is difficult to think of some sport whose parameters or equipment the covered stadium cannot accommodate. Ice hockey or track, rugby or gymnastics, football or mass skating can be held on the same day and hour as a variety show or a circus review. All this, especially the alternation of representatives of the various types of sport, requires change of the surfaces. This procedure does not cause great bother. A synthetic "green carpet" can be rolled out. And the rexortan running track can be covered. Or the icefield, larger than a football field, can also appear rather rapidly.

The stadium is so vast and multifaceted that a detailed acquaintanceship with it is transformed into a real excursion. On pursuing it, we found out that a hockey field, halls for choreography and sports games are located here in two of the training areas, the northern and the southern. Here also are recovery centers, equipped for the latest word in medicine. At the disposal of visitors are the Severnyy Luch restaurant, two cafes, a dining hall, a bar and snack bars.

After completion of the Olympic Games the complex is to have the strenuous and full-blooded life of a huge general-purpose center for large-scale physical culture and major sports.

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STATUTE ON BUILDING RESIDENTIAL, PUBLIC, COMMERCIAL FACILITIES

Moscow EKONOMICHESKAYA GAZETA in Russian No 12, 1980 p 6

[Article: "Regulations on Single Customer Services for Construction of Residential, Cultural and Municipal Facilities"]

[Text] Approved by USSR Gosstroy decree No 11 dated 12 February 1980.

1. General Considerations

1.1. Pursuant to the USSR Council of Ministers decree No 173 dated 1 March 1978 "On Measures To Expand the Practice of Integrated Residential, Cultural and Municipal Line Construction in Cities" the functions of a single customer for contract construction of residential, cultural and municipal facilities are the responsibility of the Executive Committees of the Soviets of the People's Deputies or the enterprises (organizations) of the ministries and departments which perform the major portion of construction of industrial and non-industrial facilities in the particular city, together with the transfer to the single customer on a shared basis of capital investments allocated for residential, cultural and municipal construction by the enterprises (organizations) located in the given city, regardless of their departmental subordination. The list of cities (populated areas) in which the functions of a single customer are the responsibility of the enterprises (organizations) is established by the Councils of Ministries of the union republics in coordination with the appropriate all-union ministries and departments.

1.2. In cases where in a city the functions of a single customer for contract residential, cultural and municipal construction are the responsibility of the Executive Committee of the local Soviet of the People's Deputies, the creation of a single customer service in the form of a Capital Construction Administration (Department) is formalized by the enterprise's (organization's) management in accordance with established procedures.

1.3. Expenditures associated with the Single Customer Capital Construction Administration (Department) are financed with funds used to maintain technical supervision of construction by the customer as provided in Chapter 8 of the Consolidated Estimates for Facility Construction within wage fund limits and the maximum allocations for maintaining the managerial structure as established by the next higher organization for the plan year.

1.4. The Single Customer Capital Construction Administration (Department) performs its duties jointly with the planning commission, the Construction and Architectural Administration (Department) and other interested subdivisions of the appropriate Executive Committee of the Soviet of the People's Deputies and also the chief contract organizations, the chief design organization and local (territorial) organs of the USSR Stroybank, USSR Gossnab and other organizations (enterprises) which provide financing and supply of materials and machinery for residential, cultural and municipal construction.

2. Primary Mission

2.1.The primary mission of the Single Customer Capital Construction Administrations (Departments) for contract construction of residential, cultural and municipal facilities is to insure jointly with other organizations listed in paragraph 1.4 of this regulation:

a) planned implementation of the approved long-range urban development plans and projects for the detailed layout of city rayons;

b) integrated implementation of the construction of residential rayons and microrayons and related improvement of public and municipal services;

c) improvement of the architectural appearance of cities and the quality of residential civil construction;

d) adoption of methods for integrated line construction of facilities on the basis of continuous planning;

e) fulfillment of the state capital construction plans to place in service nonindustrial facilities and fixed capital and also on-schedule completion of facilities;

f) the most effective utilization of capital investments, labor and material resources, funds for design and surveying work allocated for urban development by adopting methods for integrated line construction of facilities on the basis of continuous planning and other effective methods and forms of construction organization.

3. Obligations

Pursuant to accomplishment of its mission the Single Customer Capital Construction Administration (Department):

3.1. Participates jointly with the planning commission and the Construction and Architectural Administration (Department) in developing five-year and annual (biannual) draft plans for residential, cultural and municipal capital construction in the particular city, including facilities constructed on a shared basis. Reports jointly with the planning organs on the acceptance-transmittal in accordance with established procedures of capital investments allocated for construction of such facilities on a shared basis and for incomplete facilities of planning estimates for these facilities, funds for equipment and materials supplied by the customer, uninstalled equipment and materials received on the basis of these funds, plans for labor utilization and the surplus limits of maximum allocations for technical supervision of construction by the customer as stipulated in Chapter 8 of the Consolidated Estimates for construction of these facilities.

3.2. Participates jointly with the Construction and Architectural Administration (Department) and the planning commission of the Executive Committee of the Soviet of the People's Deputies in developing five-year draft plans to establish the location of construction to be performed in the city by contract, including the construction of residential, cultural and municipal facilities using capital investments transferred to the single customer by the enterprises (organizations) of the ministries and departments on a shared basis.

3.3. Monitors jointly with the Construction and Architectural Administration (Department) of the Executive Committee of the Soviet of the People's Deputies compliance by the design and construction and installation organizations established for the appropriate five-year period with the planned pattern of residential and cultural construction and the average cost estimate indicators for construction of residential buildings, general-education schools, children's preschool and other facilities on the basis of units used to measure the planning of capital investments for such construction.

3.4. Participates in accordance with established procedures in developing lists and title lists for nonindustrial facilities planned for construction in the city.

3.5. Concludes in accordance with established work schedules contracts and additional agreements for performance of design and surveying work and implementation of designer's supervision over construction together with the chief designer (and other design and surveying organizations), coordinates with them schedules for development and submission of design work and planning estimates, and also monitors compliance with their implementation.

3.6. Participates in the work of the Construction and Architectural Administration (Department) of the Executive Committee of the Soviet of the People's Deputies associated with the preparation of architectural design assignments and also initial data needed for facility design, and transmits this data to the chief design organization (and other design organizations) in accordance with established procedures.

3.7. Verifies the completeness and quality as well as acceptability of planning estimates and other construction documentation received from the design or surveying organization (assigning documentation submission deadlines as required) and its timely transmittal to the chief contract organizations(s).

3.8. Concludes on-schedule long-term and annual contracts for capital construction with the chief contract organization(s) or additional agreements related thereto, and also special conditions associated with these contracts.

3.9. Supplies in accordance with a mutually acceptable schedule the contract organization(s) with documents certifying authorization by appropriate organs of allotment for construction of a parcel of land and also for performance of work associated with construction preparation as established in the existing Regulations on Capital Construction Contracts.

3.10. Insures timely removal from future construction sites of interfering buildings, structures, underground connections and plantings, including preparation of proposals to resolve all problems associated with work and expenses for demolition and removal of above as established in the existing Regulations on Capital Construction Contracts.

3.11. Insures construction using production and engineering equipment and materials to be supplied by the contractor in accordance with existing regulations. For this purpose the Single Customer Capital Construction Administration (Department):

a) compiles and submits on schedule in accordance with established procedures requisitions for these materials, their receipt and distribution with priority given to construction projects already underway;

b) submits justifications, materials lists, performance characteristics and necessary technical purchasing documents to supply and marketing organizations;

c) participates in defending justifications in the fund allocation process and in concluding contracts with oblast' (kray) supply and marketing organizations for the supply of equipment and materials, and also receives fund allocation notifications as well as monitors their implementation.

d) submits complaints to supplier plants and supply and marketing organizations in the event that equipment incompleteness or defects, substandard material quality or delivery delays are established.

e) correlates allocated material resources with financial allocations as stipulated in estimates and title lists which serve as the basis for resource acquisition and transmits to appropriate organizations allocated funds and assets for payment.

3.12. Insures timely financing of design and surveying work and construction in accordance with allocated funds and the volume of capital investments and transmits technical documents to the USSR Stroybank financial division using standard forms and in accordance with the procedures and schedule established in existing regulations.

3.13. Performs technical supervision of construction

3.14. Issues acceptance reports and accepts contract organization bills payable by USSR Stroybank agencies for completed construction and installation work in accordance with procedures established in existing Construction Financing Regulations; participates in the acceptance of work subsequently concealed by other work and in the interim acceptance of important stages of construction, and also issues reports certifying work completion.

3.15. Through appropriate financial resources insures payment of finishing work for production and engineering equipment systems performed by installation organizations in accordance with established procedures.

3.16. Appoints a working commission to certify final acceptance of completed construction projects in accordance with established procedures.

3.17. Presents ready-to-go, completed construction (renovation) projects and facilities to the state acceptance commission and submits needed documentation to it, and also participates in state acceptance commissions for acceptance of completed facilities in accordance with existing Facility Construction and Acceptance Regulations.

3.18. Participates in the transfer to enterprises (organizations) in accordance with established procedures of total floor space in residential apartment houses and positions in children's preschool and other institutions constructed on a shared basis and also in the transfer to appropriate agencies of the total floor space reserved for the construction organization in accordance with procedures and in amounts established in existing all-union and republic legislation.

3.19. Performs other functions as prescribed for customer organizations in all-union legislation, the Regulations on Capital Construction Contracts, Construction Financing Regulations and other legal documents.

The rights of the Single Customer Capital Construction Administration (Department) associated with its economic activities are exercised by the chief of the Administration (Department) and, in accordance with established delegation of authority, by other officials of the Administration (Department) and in cases stipulated in existing legislation jointly, in coordination with or with the participation of social organizations.

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August 20 1980